PHOTO-ERA THE AMERICAN JOURNAL OF PHOTOGRAPHY

VOL. XVII NOVEMBER, 1906 NO. 5

PUBLISHED AND COPYRIGHTED BY PHOTO-ERA PUBLISHING COMPANY, 383 BOYLSTON STREET, BOSTON, MASS.
Entered at Post Office, Boston, as second-class matter

Editor: THOMAS HARRISON CUMMINGS
Associate Editors: WILFRED A. FRENCH, PH.D., PHIL M. RILEY

Contributions relating to photography in any and all of its branches will receive our careful consideration. While not accepting responsibility for unsolicited contributions, we will endeavor to return them if not available, provided return postage is enclosed.

SUBSCRIPTION RATES

The annual subscription in the United States, Canada, and Mexico is $1.50. Single copies, 15 cents each | Subscription in other countries in the Postal Union, $2.50
Always payable in advance

ADVERTISING RATES ON APPLICATION

CONTENTS — ILLUSTRATIONS

The Beeches in Autumn ..... *Theodore Eitel* 276
Views in the Rockies ..... *Louis J. Christie* 277–283
P. A. of A. Salon Picture ..... *J. C. Strauss* 287
Cape Malay Laundry ..... *Mrs. Caleb Keene* 289
P. A. of A. Salon Picture ..... *F. W. Hornbaker* 293
P. A. of A. Salon Picture ..... *W. S. Lively* 297
A Toiler of the Sea ..... *W. H. Porterfield* 298
A Daughter of the East ..... *Cleo. S. Bourgeois* 299
P. A. of A. Salon Picture ..... *W. N. Brenner* 301
A Chinese Shop-keeper ..... *Lawrence Macomber* 302
The Draftsman ..... *Chas. Vandervelde* 303
Cameo Relief Prints ..... *Dr. F. Detlefsen* 304
The Garden Spider — Life Size ..... *John Boyd* 305
Spider's Web among the Trees ..... *John Boyd* 306
Spider's Web Coated with Dew ..... *John Boyd* 308
Spider Watching his Prey ..... *John Boyd* 309
A Disputed Right of Way, Kodak Exhibition ..... *Agnes Tomlinson* 310
The Lemon, Kodak Exhibition ..... *H. B. Conyers* 311
P. A. of A. Salon Picture ..... *George G. Holloway* 314
P. A. of A. Salon Picture ..... *George J. Rogers* 317
P. A. of A. Salon Picture ..... *Belle Johnson* 321
The Children's Thanksgiving Dinner ..... *R. Duehrkoop* 324
First Prize — Mother and Child Pictures ..... *Hana Robison* 329
Second Prize — Mother and Child Pictures ..... *Maud S. Lee* 330
Third Prize — Mother and Child Pictures ..... *H. E. Parmenter, U. S. N.* 330

ARTICLES AND POETRY

A Summer in the Rockies ..... *Louis J. Christie* 277
Improvements in the Defraction Process of Color Photography ..... *Herbert E. Ives* 285
"Dodging" the Negative ..... *I. H. Green* 296
When the Photographer Travels ..... *David Gray Archibald* 302
Cameo Relief Printing ..... *Dr. F. Detlefsen* 303
Araneous Photography ..... *John Boyd* 305
A Triumph in Kodakery ..... *Wilfred A French, Ph.D.* 310
Dream On — A Poem ..... *Wildie Thayer* 312
On the Use of Alums in Combined Toning and Fixing Baths 313
Solitude — A Poem ..... *Wildie Thayer* 315
The Ozobrome Process 316
Before the Tempest ..... *Isabella Howe Fiske* 323

DEPARTMENTS

EDITORIAL 325
THE ROUND ROBIN GUILD 327
THE CRUCIBLE 333
THE FILTER 336
NOTES AND NEWS 337

Copyright, 1906, by Photo-Era Publishing Company.

THEODORE EITEL
THE BEECHES IN AUTUMN

PHOTO-ERA

The American Journal of Photography

VOL. XVII NOVEMBER, 1906 No. 5

LONG'S PEAK FROM MOUNT TYNDALL

A SUMMER IN THE ROCKIES

LOUIS J. CHRISTIE

Illustrations by the Author

YOU may look through the magazines and the daily papers all winter long to find a place to spend your summer vacation and yet not be at all satisfied. Mr. Smith, your next-door neighbor, goes to Europe and you know he will come back with a long list of things he wants to tell you. Johnson, the clerk at the office, goes to a fashionable summer resort and squanders all his hard-earned savings trying to be "it" for just a little while, and he is bubbling over with excitement as he recites the same old story of the "peaches" he met. Then there is Willie, the office-boy, who is out on some creek camping, and he too will have his story.

Still, you stay at home just because those other things don't interest you.

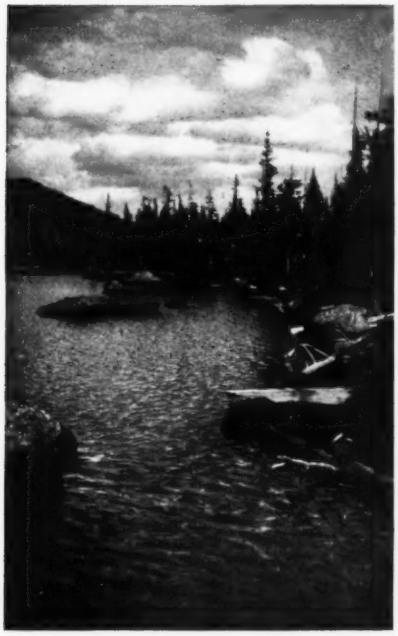
Now take a map of the United States and look about two thirds the way across and you will find a few dotted lines and the words "Continental Divide," or "Front Range." That 's the place for your summer vacation! You are tired of people, cars and dirty streets, and the mountains, with their pure air, so dry and bracing, will appeal to you as nothing else can.

I remember the day I had my first stage ride over the pass leading to Estes Park from Lyons, a few miles north of Denver. Any one having any knowledge of mountain roads would laugh at the idea of calling it a pass, but it seemed like one to the few of us who were riding over it for the first time. The driver was so careless, as he turned the leaders around the corners on the narrow ledges when only a few feet would mean sudden death to us all! But afterwards, when I came back over that same road, my principal idea was to get to sleep. It was so tame compared with the real passes and narrow ledges that the summer's outing had taken me over!

I stayed around the rustic ranch-house at the foot of Long's Peak over two weeks before it was possible to do any more than climb the green-covered hills that spur out from the higher ranges. The rarity of the air, nine thousand feet above the level of the sea, was so pronounced that it hindered any long walks, and running was an impossibility. The first trip, when I had become acclimated, was the climbing of Long's — one of the most beautiful and imposing of all the peaks in the Rockies, and, according to Mr. Conway, the famous mountain climber, one of the most difficult in the world to climb. Irregular on all sides, it stands out above everything else, a landmark for miles around.

A party of us started at four in the morning on horseback, and up the side of the mountain, as the trail wound in and out, the little brooks bubbling over it in places, the sun rose gradually and cast its weak yellow light on the topmost part of the peak before us. Finally it came into view over the top of the Twin Sister Mountain several miles away, glowing red and casting weird shadows on the last few trees at Timberline — trees that have stood up bravely, sheltering those behind them for hundreds of years, bearing the brunt of all the snow and hail the Storm King could hurl at them during his reign of nine months in the year. Bared of bark, twisted and bent, with only a little foliage on the very tips of the branches, stunted in growth but still living, they stand there, unconquered to the last! It is at this place that Enos Mills, the man who knows and loves this old mountain, judges the characters of the people he guides up its steep and rugged sides. It is easy, he says, to tell whether a man will reach the top or not merely by his actions and exclamations as he goes by Timberline.

And the trail winds on, past huge banks of snow, until Boulderfield is reached, with a totally different view of the peak. We left our horses here and tied them to small rocks so they would not graze, and then started on foot across this vast field of boulders, a mile square, the most monotonous stretch on the trail. The longer you walk the longer it seems, and the last stretch before reaching Keyhole is enough to make any one want to turn back; but there is something in store for those who do keep on. Standing in the small opening which so resembles the keyhole in a door, there lay below us a vast gorge bounded on all sides but one by precipices, so steep that a shivery feeling creeps around, and you wonder what you would look like if you happened to fall over. You could look for hours into this vast amphitheatre and yet not see half that it contains. Here, again, is a new aspect to the lofty peak above, and it is just as far



THE PALISADES ON LONG'S PEAK

YPSILON LAKE, MUMMY RANGE

MOUNT YPSILON

away as when we started; but move we must, for those who linger never reach the top.

From Keyhole on the climb is over dangerous rocks, narrow ledges with huge walls above and ragged sloping sides below, where just one little misstep is a free pass to eternity. Along the trail, the first long stretch is called the Slide — a scaly wall of rock pitched at an angle of sixty degrees; not a difficult place to get over, but it leads to the Trough, which is long and tiresome, besides being hard. Then the Narrows, with their precipices, scary places and hard climbs; and last but not least, the Homestretch — a series of fissures where there is no trail, and, picking our way back and forth as best we could, resting every few steps, we finally reached the summit, a flat field of rocks, about three hundred feet wide and six hundred long, desolate, with only the occasional cry of the little cony — half mouse and half squirrel — who lives there, 14,276 feet above the sea-level.

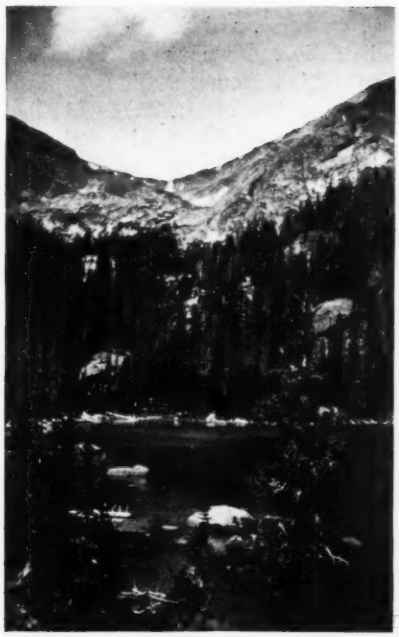
From there, looking in all directions, nothing was visible but mountains; Pike's Peak lay 108 miles to the south, and beyond it the San Juan and Sangre de Christo ranges stood out as clearly as if we had photographs of them before us. On the north, the Uintah, Laramie, Medicine Bow and Mummy ranges were surrounded in frames of bright clouds; to the southwest the College Peaks and the Mount of the Holy Cross — in fact, nearly all of the high peaks of Colorado could be clearly seen.

The gigantic glaciers on the Arapahoes and the Mummy ranges looked like small patches of snow, but with the aid of a strong glass, the air was so clear that we could see the great yawning crevasses, and it was so near and natural we even listened to hear some bubbling stream running down among the rocks.

After a half-hour of wonderment we started the descent, refreshed and apparently as strong as ever, for it does n't take long for one to recuperate in the mountains. We passed the Palisades with their huge flakes of granite sticking straight up into the air, and old Muker, with its fourteen thousand feet of grandeur and its top covered with snow and clouds, forming a view so awesome and frightful that all of us exclaimed at once that it was too wonderful to be true. Of the small percentage of those who get beyond Keyhole, only a few can stand the gruelling climb up the Homestretch; and so near the top, yet so far away, they sit here at the foot of it and look at Muker until the stronger ones come back.

Three hours later we passed Timberline, and at five in the afternoon we reached the ranch, just as the sun was setting — tired, but happy, that we, insignificant mortals, were able to master so great a creation.

Then there are other trips than that of climbing Long's that may be taken from Mills' Ranch — one especially that a party of us made, in one day, up the St. Vrain River to its source at the foot of Mt. Tyndall. In climbing a mountain one encounters the beauties of nature as to the views and magnificence of the rocks that lie there, but in this trip up along the St. Vrain we encountered some of the wonders of nature I never before had the pleasure of meeting.



YPSILON LAKE, MUMMY RANGE

ESTES PEAK FROM MT. OLYMPUS

TIMBERLINE ON LONG'S PEAK

We left the ranch one morning at five, on horse, and dashed along the road at a good rate to get the blood into circulation. An hour or so later we passed Copeland Lake, one of nature's mirrors lying about ten miles north of Allen's Park, and it was there that we got our first view of Mt. Tyndall in the distance. It seemed a long way off, and some of us even doubted if we should be able to reach it before noon; but the air was cool and the horses were fresh, so we cantered on. Later we broke from the road and followed a faint trail into a seemingly impenetrable forest, where the trees never had known the ravishes of fire and grew there as God wished them to grow, revealing the beauty of nature to the fullest extent. Some of them had moss hanging from the tips of the branches — light green moss that made you think there was some truth in the theory that it had been at one time covered with water. Others, as large as three feet in diameter, stood up proudly, and would no doubt have bowed to us if we had not been so small.

Winding back and forth through the undergrowth, sometimes catching a glimpse of the roaring river as it rushed over the rocks, so kindly placed there that it might make itself known, we gradually rose higher and higher until we emerged from the forest and came out suddenly at the foot of the mountain which was our goal. Just in front of us lay a beautiful, quiet little lake surrounded by trees and rimmed with large boulders and tall green grass, with snow-speckled mountains standing straight up in the background as if to defy us to go farther.

After tying the horses we started around the lake and up the side of Tyndall, but on account of lack of time we were unable to get beyond Timberline, and there we stayed to eat our lunches. Again we got a different view of Long's as it stood out above the high moraine running from the side of Muker on the range. From this side the difficulties of ascent could be seen more plainly, and the lack of snow showed how steep and smooth the rocks were.

But it was fast growing late, and we, tired and weary, commenced our trip back, first going around the lake on the other side to see if there was anything we had missed. At seven we were at the ranch. After supper, finding that the lake had never possessed a name, I suggested that it be named Ouzel Lake in honor of the valiant little water ouzels that are so numerous there. And therefore I speak of it as such, for so beautiful a creation should at least have a name.

A week or so later a terrible accident occurred, in which a young student lost his life while attempting to descend one of the rugged peaks on the Mummy Range, Mt. Ypsilon; and soon after that, Mills, another mountaineer, and I started out with the purpose of finding a trail up the face of the mountain so that some men could carry materials up to build a tomb of granite over the boy's body. Our start was very early, and it was only sunup when we reached Horseshoe Falls, preparatory to our climb over the long moraine which emerges from the side of the range. After several hours of ascending we came in view of the mountain towering above us, and, after tying the horses, we started out

MOUNT TYNDALL AND OUZEL LAKE

to make the ascent. Of a sudden, in the midst of a wild and unknown region, we came upon one of the most beautiful of mountain lakes I have ever seen. Its surface, dotted here and there with large boulders, and the little birds flying back and forth, seemed to perfect the scene. It was a shame that we could not stay; but hard and tedious work was before us, so, loaded with cameras and raisins (our lunch), we started on again.

By picking a trail, sometimes having to go back and try again, other times getting drenched by having to go under falls to get higher, we advanced and came out on a flat space directly at the foot of the immense wall of granite which is called Mt. Ypsilon. The mountain gets its name from the two large fissures which start very near the top and join farther down, making a Greek *r*. These gulches are filled with snow throughout the year, thus enabling one to see the great letter for miles.

From here on the climb was comparatively easy, and our mission was soon accomplished. On returning we had several minutes to spend around the small lake — Ypsilon Lake, by the way — and we found numerous places where the rocks hung over enough to shelter several campers, and, if possible, we were coming back; but I regret to say it was not accomplished. The return was over the same ground, and quite as slow as the ascent, on account of the fallen timber; consequently we did not arrive at the ranch until very late.

IMPROVEMENTS IN THE DIFFRACTION PROCESS OF COLOR PHOTOGRAPHY

HERBERT E. IVES

THE diffraction process of color photography, invented by Prof. R. W. Wood, of Johns Hopkins University, in 1899, is an application of the well-known three-color method of reproducing colors by photography. This method depends primarily upon the observations of Young, Helmholz and Clark Maxwell, that all the colors of the solar spectrum may be counterfeited to the eye by mixtures of three narrow bands of color from the spectrum; these colors are *red*, near the Fraunhofer line C; *green*, near E; and *blue*, near F. For instance, red and green mix to give the eye a sensation of yellow indistinguishable from the true yellow of the spectrum; red and blue mix to give purple, and the three colors acting together produce a white whose difference from ordinary white light can be detected only by analysis with a spectroscope. What applies to spectrum colors applies equally well to the varied hues of nature. The coloring of such an object as a basket of fruit can also be duplicated to the eye by mixtures of the three primary colors: the tint of an apple, by a large proportion of red, less of green and blue; of a lemon, by nearly equal parts of red and green; of grapes, by a large proportion of blue.

The three-color process can be reduced to two problems: first, the production of three photographic negatives, each of which shall be an exact record of the amount of one of the primary colors requisite to mix with the others and counterfeit to the eye the color of the object photographed; second, some means of furnishing each record with its appropriate color and combining it with the others.

The solution of the first problem has been arrived at from experimental quantitative determinations of the mixing proportions of the primaries to produce the other colors. From these determinations three-color screens can be prepared, which, when used with suitable photographic plates, will yield three (black and white) negatives, each having the desired destitution of light and shade to form a record of one primary color. The negatives thus obtained are the basis of all three-color reproduction methods.

Numerous means have been suggested and tried for combining the three-color records with their corresponding colors. They may be placed in a triple lantern, each illuminated with its proper colored light and projected, superposed, upon a screen. The superposition may be effected by a system of mirrors, as in the Kromskop; by the use of three thin transparent films properly colored; by triple printing on paper, after the manner of much of the present-day magazine illustration.

A process which must be noted somewhat in detail because of its direct bearing on the recent development in diffraction color photography is the so-called Joly process, first published, as a matter of fact, by Louis Ducos du

Hauron in 1869. Combination of the colors is effected in this by breaking up the three-color records into narrow lines, arranged in succession, a line of the red record, a line of the green, a line of the blue, and so on, repeating across the picture. This triple record, whose lines should be close enough together to be indistinguishable by the eye, is mounted over a triple ruled color-screen — a line of red pigment, a line of green, a line of blue, similarly spaced to the lines of the picture. The result, if the lines are fine enough — a condition never yet attained in the actual working of the process — is that the eye blends the lines to form a structureless color picture in the form of a transparency.

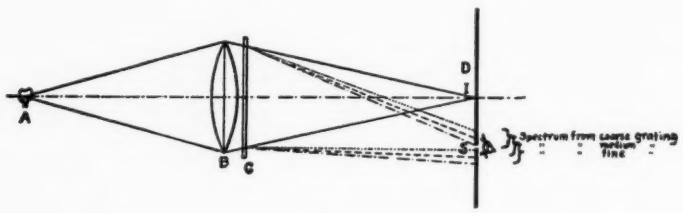


Fig. 1

The diffraction process, which is the subject of this paper, departs widely from the other methods. Its distinguishing feature is that for the production of the primary colors to view the records use is made of the diffraction grating; that is, of a transparent polished surface, usually of glass, ruled with fine parallel straight lines, several thousand to the inch. It is the property of a diffraction grating that if a bright line or point of light is viewed through it, not only will the light source be seen, but spread out to either side will be a series of spectra, those nearest the source being called spectra of the first order; the next, of the second order, etc. If the number of lines to the inch on the grating be increased, the spectra are thrown farther from the central image, and vice versa.

The power of a grating to produce color is taken advantage of in the following way: Suppose we have a convex lens forming on a screen an image of a bright source of light, such as a gas flame. If the eye is placed where the image is formed, the lens is seen uniformly and brilliantly illuminated. Suppose now a diffraction grating is placed over the lens. In addition to the image formed as before, there will be produced a series of spectra. If the eye is placed in one of these the lens will, as before, appear illuminated — not, however, by light of the color of the source, but by the color of light striking the eye.

If now we can make one of our color records in the form of a diffraction grating of varying strength to correspond to the desired differences in the amount of the primary color, and place it over a lens, points can be found in the lateral spectra in which the lens (and the grating in coincidence with it) will appear as a colored picture. Further, since, as we have seen above, the distance of the spectra from the central image depends upon the fineness of the grating spacing,

PORTRAIT BY J. C. STRAUSS, ST. LOUIS, MO.
P. A. OF A. SALON

it is a simple matter to choose three gratings, one of which will send red to a chosen point, the second green, the third blue. Hence, if we can make the three primary color records in the form of three diffraction gratings of three properly chosen spacings, each may be seen in its proper color by placing the eye in one of the diffraction spectra formed as above described.

In Fig. 1 we have represented the conditions for viewing diffraction color pictures. A is a source of light, B a convex lens, in front of which are three gratings G. On the screen D fall the central image I and three spectra (only the first order spectra on one side are represented) so placed that the red of one, the blue of another, and the green of the third are superposed on the slit S, at which the eye is placed.

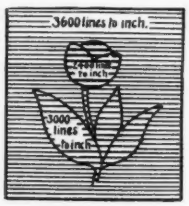


Fig. 2

In Fig. 2 we have represented diagrammatically a diffraction color picture of a red flower with green leaves on a blue ground. The coarse spacing of the lines in the flower represents a grating to send red light to the eye, say 2,400 lines to the inch; the medium spacing of the leaf, one to send green to the eye, say 3,000 lines to the inch; the fine spacing of the background, one to send blue, say 3,600 lines to the inch. Mixed colors would be given by two or three gratings acting together.

To produce such gratings by photographic means the bichromated gelatine process, which lends itself well to the copying of minute structures, was used. In contact with a surface sensitized in this way was placed a glass grating; the image of the corresponding color record was then projected upon the surface for a sufficient time to give a full exposure. The grating was removed, another substituted and exposed under its corresponding color record, and so with the third. In this way all three grating pictures were printed, one on top of another, forming a picture which by diffused light was transparent and quite invisible, showing its color only when viewed with the proper combination of lens and bright source of light. In practice it was found impossible to get three impressions on one gelatine surface and so two were made on one surface and the third on another, the two surfaces being afterwards placed in contact. From the pictures made in this way copies could be made by simple contact printing on bichromated gelatine. Since a direct copy of a grating is still a grating, *i.e*, a series of lines, the process is a positive one and copies are not reversed in light and shade as in making copies of ordinary photographs.

MRS. CALEB KEENE CAPE MALAY LAUNDRY

It is obvious that quite apart from its scientific interest the diffraction process promises very real advantages. For instance, the colors used are beyond question pure spectrum colors, and so there is no need to depend on dyes or colored glasses; also the ease and cheapness with which copies can be made places it in a class by itself among three-color processes. So perfect, indeed, did the process seem theoretically when first published that there was every reason to expect results fully comparable with the best of other methods.

This early promise was not fulfilled. A few pictures were obtained, interesting as scientific curiosities only. No dependence could be placed in the results: some colors reproduced well; others did not; occasionally a good picture would be made, but the same procedure applied to another subject brought no success. Six years after its publication the process had made no progress and seemed fated to rank as a failure.

Last summer, through the courtesy of Professor Wood, the writer was loaned a number of diffraction gratings, ruled on the Rowland dividing-engines at Johns Hopkins University. Experiments with these revealed a fundamental defect on the above-described mode of making diffraction pictures. By finding means to overcome this defect, results have been obtained of a remarkable degree of perfection.

The defect referred to is that the three gratings, in order to get their joint

effect, were *superposed*, being, as we have seen, printed one on the other. In so doing the assumption was made that the effect of superposing gratings was to add their separate effects. As a matter of fact, additional, disturbing effects are introduced, partly due to the inability of the gelatine surface to take several grating impressions without mutual blotting-out, and partly — chiefly, in fact — to the forming of a new compound grating. That is, if two gratings of different spacings are superposed, the two spacing periodically get in and out of step with each other, and this new periodic structure forms itself a diffraction grating. The new grating then forms its own series of spectra, which subtract light from the original ones. Therefore, when the two gratings are superposed, the eye, instead of receiving a double quantity of light, receives much less than the double quantity. Even more serious than this loss of light is the fact that the new spectra due to the two gratings together frequently fall in such a position as to introduce *false colors*. This is well illustrated by taking two gratings of different spacing and placing them on one another at right angles. Two sets of spectra will be formed, one by each grating, and parallel to it, and, in addition, a number of diagonally disposed spectra. As the gratings are turned into the same straight line all the spectra turn, and the additional diagonally placed spectra take up positions between the spectra formed by the original gratings. Consequently, while the eye may receive red from one grating and blue from another, one of the spectra due to the two together may send some other color, such as green. This case actually occurred frequently, a pink rose reproducing as green, and red and blue color discs superposing to give green instead of purple.

These observations made clear the necessity for some method of obtaining the effects of the three gratings other than by superposition. It was at once seen that this could be accomplished by a procedure similar to the Joly process; namely, by having the grating elements in narrow juxtaposed strips. Some experiments had already been made by Professor Wood with Joly pictures, not, however, with the specific purpose above mentioned, but rather to illustrate the possibility of making such pictures with very much finer color lines than it is possible to do by ruling alternating colored pigment lines for the observing-screen. The mode of procedure involved laboriously ruling a special grating consisting of several lines of one spacing, followed by several of another, and then several of the third, repeating all the way across the plate. The width of each strip of lines was made to correspond to the width of an element of the Joly picture. From this grating a print was made on the special-line picture, which had been previously flowed with gelatine. This in turn was used to print gelatine copies.

A practical disadvantage of this plan, aside from the use of the special grating, is that one is restricted to the use of original Joly pictures of a certain definite spacing of line, determined by the limitations of the process employed in their production. A much more serious defect arises, however, in this way: the "Joly lines," if made, as they should be made, several hundred to the inch,

themselves form a diffraction grating, which, as it is parallel to the three principal gratings, forms spectra superposed on those depended on to reproduce the colors of the object. This is quite as serious a defect as that arising from superposed gratings, and is sufficient to condemn the procedure.

From a consideration of these various difficulties it followed that some means of breaking the picture up into lines was imperative, and that that means should not involve the use of a special grating, nor of special Joly original pictures, difficult to obtain, and, most important of all, the narrow color strips or Joly lines must be arranged in some way so as not to give disturbing grating effects.

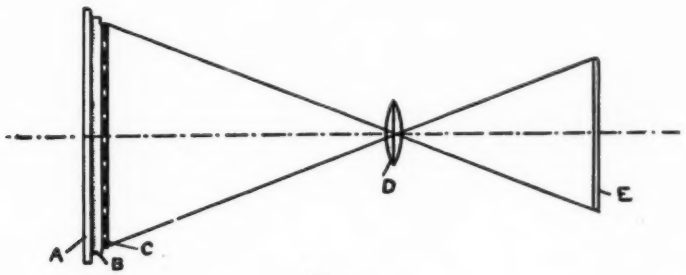


Fig 3

All of these ends were achieved by the following procedure:

In Fig. 3, which represents the method of making the improved diffraction pictures, A is the bichromated gelatine plate, rigidly fixed in position; B is a glass diffraction grating; C is a line screen, ruled with at least two hundred lines to the inch, with the opaque lines twice the width of the transparent; D, a lens; and E, a positive color-record to be copied. The latter is an ordinary three-color positive containing no lines or structure, and the grating is an ordinary continuously ruled one. With, say, the red record at E, and the corresponding grating at B, an exposure is made, resulting in a series of narrow strips. A second positive is then placed at E, the corresponding grating at B, and the ruling C moved the width of a transparent portion. A second exposure is then made, the opaque lines shielding the previously exposed surface, and a similar treatment given to the third positive. There results finally a picture made up of alternating strips of three different gratings.

To eliminate the grating effects of the narrow strips of gratings considered as lines, the device is used of making the strips (Joly lines) run at right angles to the diffraction grating lines, so that the spectra produced by them are thrown off in another direction and do not enter the eye. Although the device is simple, it is of extreme importance, and its adoption is rendered possible only by the plan described for making the pictures. The difficulties in the way of ruling a special grating with the three gratings disposed in a similar manner are practically insuperable. It is obvious that the strips of grating can be made as nar-

row as desired — easily narrow enough to be indistinguishable as such by the eye.

Fig. 4 gives an idea of the appearance of the finished picture under the microscope. The short, fine lines are the diffraction grating lines furnishing the three primary colors: 2,400 to the inch for the red, 3,000 for the green, and 3,600 for the blue. The broad strips at right angles to the grating lines constitute the "Joly lines," of which there should be at least two hundred groups of three to the inch.

When viewed with a lens and bright source of light, the pictures made in this way are entirely free from the formerly obtained defects. The colors are pure and brilliant, and, unlike ordinary Joly pictures, the color lines are too fine to be visible. The results, indeed, approach those obtained with the Kromskop.

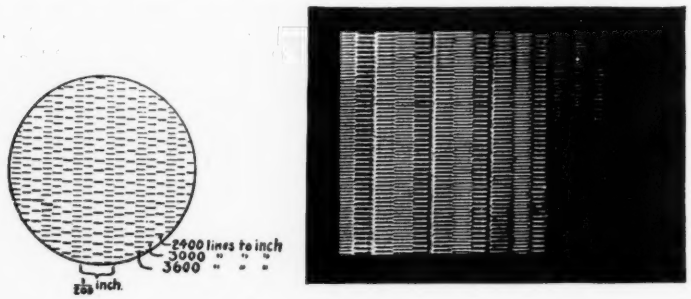


Fig. 4

As a further modification of the original method the writer has found it possible to dispense with three gratings and obtain the colors with a single grating spacing properly used. To do this the source of light must be a rather long slit. Viewed through a grating the slit of course gives long spectra parallel to its length. If now the grating be rotated about, the perpendicular dropped from it to the slit, the spectra move in toward the slit. [The accompanying shift parallel to the length of the slit is compensated for by the slit being long.] So by suitable rotation any desired spectrum color may be obtained at a chosen point. Starting with a grating of 3,600 lines to the inch to give the blue when parallel to the slit, a rotation of about 21½ degrees will give the green; of 42 degrees, the red. In the absence of suitable dividing-engines to rule three properly proportioned gratings this affords an exact and easy method of securing the three colors. It has the fourth advantage that in printing copies such difficulties as securing perfect printing contact will affect all three colors alike, which is not the case with gratings of different degrees of fineness.

Figure 5 shows a portion of a picture made in this way with one grating spacing. After working out this idea the writer learned that some years ago Mr. Thorp, of Manchester, suggested the use of a single grating spacing to secure

PORTRAIT BY F. W. HORNBAKER, SCRANTON, PA.
P. A. OF A. SALON

all three colors. Mr. Thorp's plan, however, was to use three sources of light and merely rotate the gratings until they "found" the source and each cleared the source belonging to the other two. He found a rotation of ten degrees convenient. As far as the writer knows, this is the first publication of a plan to secure any desired color by rotation through a definite angle to be calculated from the wave-length.

With these improvements, probably the last word has been said on the diffraction pictures themselves. A very important improvement in the means for observing them, due to the writer's father, Mr. Frederic E. Ives, must be described.

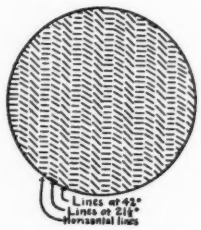


Fig 5

The lens and bright light used by Professor Wood do not form at all a convenient arrangement, nor is it desirable to use artificial light. A convenient apparatus, easily set up, not liable to get out of order, and suitable for daylight use, becomes desirable as soon as the pictures are perfected. The instrument about to be described was devised a few hours after the first pictures were obtained, and admirably fulfils its purpose. The greatest difficulty attending the use of daylight is that of getting sufficient light — the illumination of the sky, toward which an instrument would naturally be pointed, is far from intense enough. This will be appreciated when it is remembered that only a very small portion of the original light is diffracted, perhaps ten per cent at most. This difficulty has been overcome in a novel manner. Instead of depending on a single slit, as the narrow source of light, a series of slits is used, each furnishing one spectrum. In this way, with four slits, two first order and two second order spectra are utilized, yielding probably three times the light obtainable from a single slit.

Figure 6 gives the instrument in section. A, B, C, D are the four slits; M, a mirror; L_1 and L_2, lenses; P, the diffraction picture; and S, the slit through which the picture is observed. The lenses of course form an image of each slit at A^1, B^1, C^1, D^1; from each of these images, however, a certain amount of light is diffracted by the picture P; from B and C first order spectra fall on S; from A and D, second order. The use of second as well as first order spectra is a distinct advantage in that, as gratings never give a perfectly uniform distribution of light and color, certain desirable qualities of the picture are found in one

order and not in the other, while if both orders are used the resultant evening up of qualities produces particularly satisfactory results.

By disposing the grating lines in a horizontal direction and using horizontal slits as sources the pictures may be viewed by both eyes, a desirable condition for convenience and comfort.

As an instrument the "Diffraction Chromoscope" is simplicity itself. It is, in fact, used much as the old stereoscope. There are no adjustments; to use, it is merely placed before a window or Welsbach light and the pictures dropped to place. On looking into the eye slit before the introduction of the picture nothing is seen, the inside being perfectly black. The pictures themselves are transparent, colorless, and appear as plain pieces of glass under ordinary conditions of illumination. On placing them in the instrument the colors immediately flash out, a transformation which seems almost magical, affording a scientific demonstration of rare beauty.

Aside from the obvious use of the apparatus for scientific purposes, it is expected that its simplicity and the perfection of the results will ultimately lead to many important uses. Now that the long-standing obstacles in the way of success have been removed, the process should develop rapidly. Such further steps as application to lantern projection and means for making the pictures directly in the camera are under consideration.—*Journal of the Franklin Institute.*

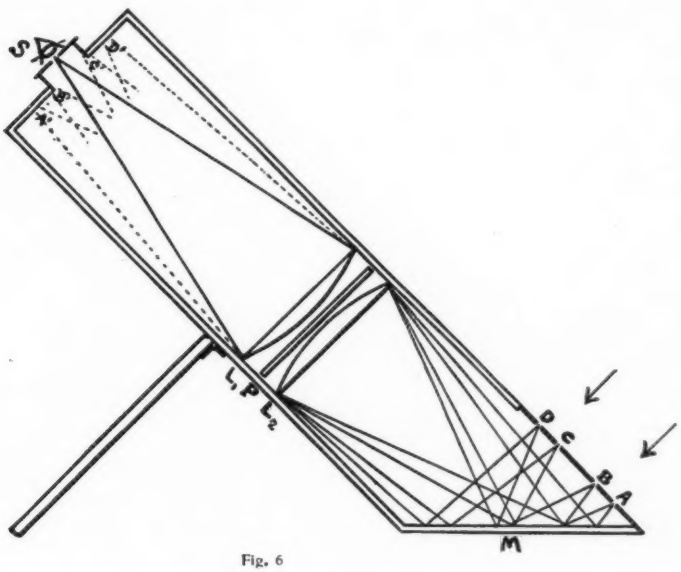


Fig. 6

"DODGING" THE NEGATIVE

I. H. GREEN

ALTHOUGH, as a general rule, a bad negative may be made into a passable one by the hundred and one methods of intensifying and reducing, there are several beginners who for various reasons do not care to tinker about with mercury, ferricyanide and other dangerous chemicals. Some amateurs do not care to have any dangerous poisons in the house for fear of accidents, while others do not care to treat their favorite negatives with chemicals with which there is a chance of going wrong and ultimateruination. However, if *carefully* carried out, I can see nothing whatever against chemical intensification or reduction. I have several negatives in front of me which were intensified with mercury and reduced by means of ferricyanide, and I can perceive no change in them.

My object in the present article is to put before the readers of this magazine a few methods of dodging and faking negatives without treating the film with chemicals. One of the best methods of securing a contrasty print from a poor negative is to print under green glass. If the printing-paper be the familiar P.O.P. a yellowish-green glass should be used over the glass side of the negative; this confines the action of the light principally to the citrate or other organic salt of silver, which gives more contrast than the chloride. With bromide paper the effect is not noticeable, and with platinum paper the glass must be bluish green for a black negative and yellow for a blue black.

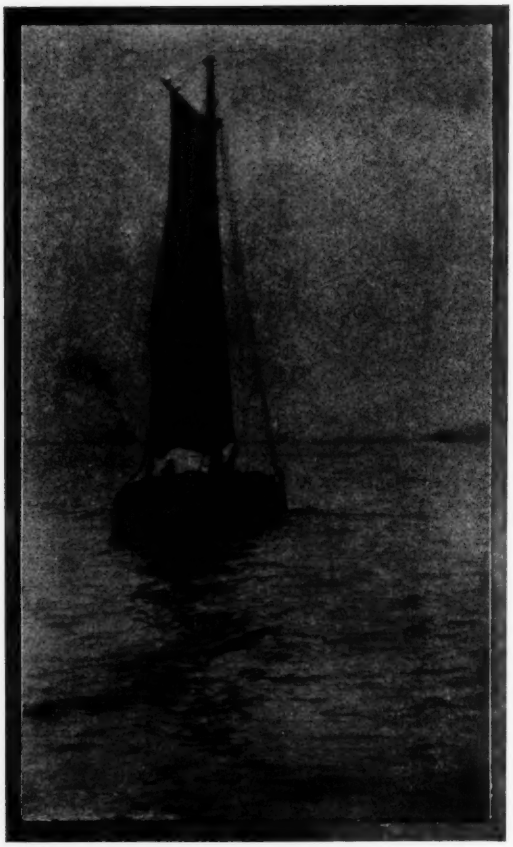
The best way to dodge the printing of bromide paper is to vary the distance from the source of light according to the negative and character of print required. A flatter print, for example, may be secured by printing close to the light, and a brighter one may be obtained by holding the printing-frame at a greater distance away. There are several other little dodges applicable to development papers, but in the present article we must deal only with printing-out papers.

Tissue paper or matt varnish are generally used for faking negatives. If it is decided to use tissue the same must be damped and gummed by the edges only to the negative. This will then dry as "tight as a drum." If, however, we decide to use matt varnish, the same can be bought very cheaply, or made as follows:

Sandarac	½ ounce
Mastic	48 grains
Methylated ether	5 ounces
Rectified benzole	2½ to 3 ounces

Dissolve the sandarac and mastic in the ether, filter if necessary, and then add the benzole. The less benzole used the coarser the grain. Keep in a well-stoppered bottle, and do not use the varish near a naked flame, as it is dangerous and is highly inflammable. Be careful to get benzole and not petroleum *benzene.* If preferred, the benzole may be kept separately from the other ingredients, and more or less added to a portion of the ether solution immediately before use, according to whether a fine or coarse grain is desired.

PORTRAIT BY W. S. LIVELY, McMINNVILLE, TENN.
P. A. OF A. SALON



W. H. PORTERFIELD A TOILER OF THE SEA

To keep back a foreground and other dark shadows long enough to allow the densest parts of the negative to print, I pour this varnish over the back of the negative. As soon as the varnish has set, take a stump or a duster and clean off all that has spread beyond the portions it is desired to keep back. If the varnish becomes too firmly set, it may be scraped away with a knife. The objection to matt varnish is that it is very liable to damage, and I find that ground glass has many advantages. To use it, take a piece of ground glass and place it, ground side up, on the top of the negative, film side up; work on it, to increase the high lights, with powdered blacklead or blue pencil — the latter for medium effects. Where it is desired to increase the shadows, use vaseline or a little weak gum water; this takes away the matt appearance, and makes the glass trans-

CLEO. S. BOURGEOIS A DAUGHTER OF THE EAST

parent. After this is done, place the ground glass at the back of the negative and print as usual. A softer effect may be produced by placing the ground glass upon the back of the negative, working upon it and printing as usual. In the latter case, two thicknesses of glass intervene between the paper and ground side of glass; in the former case, only one.

Another very simple way of increasing the density of any portion of a negative is to mix some yellow or orange dye with half an ounce of gum Senegal, and apply thinly with a camel's-hair brush moistened with saliva. It adds enough density to parts of the negative required, without shutting out the detail.

Another very simple and most effective way of improving the printing qualities of a negative is by means of ordinary tissue paper and powdered black-

lead. I cut a piece of tissue paper the same size as the negative, dampen it, and stick it lightly by the edges to the glass side; it dries level and tight, and may then be worked upon with the powdered blacklead by a stump or the finger-tip. Perhaps the sky is thin and prints dark; if so, rub the blacklead upon the tissue paper over the sky portion, where it is intended to print lighter. At frequent intervals in the sky, extra dabs may be put in the form of clouds; these, when properly done, show up very effectively in the finished print. In fact, everything that prints too quickly may be held back by carefully working over the desired part with the blacklead, or a coarse soft pencil.

If in a group the faces print too dark, a touch of light blue paint will greatly improve the result. A blue pencil, too, is exceedingly handy for touching up those parts it is desired to print lighter. If, on the other hand, parts of a negative take a long time to print, or are exceedingly harsh, they may be made to print quicker by dabbing a little vaseline, thinned Canada balsam, or oil upon the tissue paper, or by cutting away entirely that part over the required portion. In the latter case, the paper may be stuck wholly upon the glass. The light, of course, penetrates more rapidly through the parts cut away, thereby helping the denser portions on before the parts covered by the tissue paper have time to go beyond the proper depth.

Another dodge for increasing the intensity of light on the denser portions is by holding a magnifying-glass in front of the frame. The time required for printing the covered patch is considerably reduced. The sun's rays must not be brought to a focus on the negative, or the heat will crack the glass.

A simple method of blocking the sky out temporarily is to hold the negative, glass side down, over a piece of lighted camphor, or the fumes of a paraffin lamp, until smoked quite black, when the surplus upon the landscape portion may be wiped away with a soft rag. Great care in handling the negative is necessary, as the blacking is very fragile and easily damaged. If a permanent blocking out is required, black varnish, non-actinic water-colors, or commercial "opaque" may be used. If the thin parts are all in one portion of the negative, a better plan, after they have printed to the required depth, is to protect them by a piece of card laid upon the outside of the frame, or with a pocket-handkerchief, which can be roughly adapted to the outline between the dense and thinner portions, allowing the printing to proceed through the uncovered portions for a further period.

If a negative be denser at one end than the other, through uneven development or uneven coating (happily now very rare), the printing-frame may be placed at the bottom of a deep, lidless box, one side of the frame resting against the side, the thinner portion being at the bottom.—*The Photographic News, London.*

Art is the uplifting of the beautiful so all may see and enjoy.
—ELBERT HUBBARD.

PORTRAIT BY W. N. BRENNER, CINCINNATI, O.
P. A. OF A. SALON

Copyright 1904 by Lawrence Macomber.

LAWRENCE MACOMBER A CHINESE SHOP-KEEPER

WHEN THE PHOTOGRAPHER TRAVELS

DAVID GRAY ARCHIBALD

IF you use a plate camera while travelling and include among your traps a dress-suit case, you can easily arrange a place to change plates in. Make an opaque cloth bag large enough to hold the suit-case with its cover extended at right angles. In this bag, have two arm-holes with tapes to tie around your arms when you put them into these holes while changing plates in the bag-covered case. As the plates are arranged in a certain way in the boxes and holders, you need not see them while making the change. It is easy to do this by feeling alone when you get used to it.

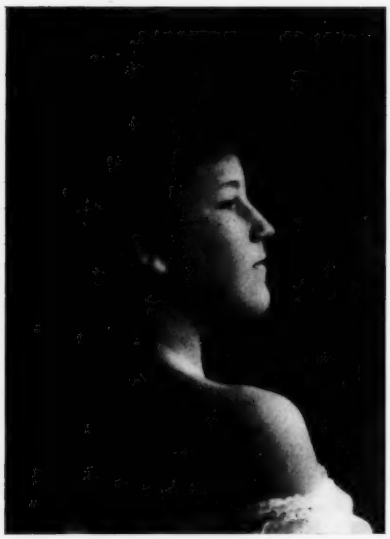
CHAS. VANDERVELDE THE DRAFTSMAN

CAMEO RELIEF PRINTING

DR. F. DETLEFSEN

CAMEO Relief Prints, so-called, may be produced successfully in two ways, briefly outlined herewith. The first method which I employed and published in the *American Annual of Photography* for 1906 is as follows:

From the negative to be used first print a positive on platinotype paper. Use a developer containing acetate of potassium and mercury, the addition of which produces great contrast — bright high lights and dark shadows. The developer is as follows: —



NUMBER 1

NUMBER 2

Acetate of potassium	½ oz.
Citric acid	½ "
Phosphate of potassium	½ "

Dissolve in warm water and add:

Bichloride of mercury	50 gr.

(Previously dissolved in boiling water)

Add enough water to make one pint and use cold.

Now put a clear glass plate into the printing-frame, and on this place the platinotype print which you have just made, "face out." On this lay the negative, "face in," so that the print and negative are slightly "out of register." Next place a sheet of platinotype paper on the negative, film to film; close the printing-frame and print carefully. Expose to direct sunlight, if possible, and print from one to three days, until a fair outline appears. Print less strongly than for ordinary platinotype printing. Develop in acetate of potash and mercury developer.

The second method, employed by me since with results equally as good, is this:

Place paper positive on negative slightly out of register. Next put a sheet of platinotype paper on top of paper positive and close printing-frame carefully. Print and develop.

The prints reproduced with this article are made by the latter process. No. 1 is the ordinary print, and No. 2 is a relief print from the same negative.

JOHN BOYD THE GARDEN SPIDER—LIFE SIZE

ARANEOUS PHOTOGRAPHY

JOHN BOYD

SOME people shudder at the sight of a spider; others watch its instinctive actions as a lesson of instruction from the zoölogical kingdom; but young and old of both of these classes wonder alike at the mathematical regularity of its web.

We might go into a long discourse on the habits of some of the various species, but perhaps it would not be inviting to the worker in photography, yet we can hardly treat the subject intelligently unless we gain a little insight into the habits of the spider — first, as to how its web is constructed; and again, under what conditions it can best be photographed by those who would picture it in all its silken beauty.

Let us take up in as few words as possible that strange and intensely interesting process of making the web of the geometrical, or garden spider, and what is said of it will apply with equal force to the workings of the remainder of the species.

The threads which form its web are not single, as one would suppose, but composed of a number of separate little strands, which are joined together as they emerge from the "spinner," an organ placed at the end of the spider's body. The substance which is emitted hardens very quickly on exposure to

JOHN BOYD SPIDER'S WEB AMONG THE TREES

the air, but there is a stickiness about it which remains for some time, the use being self-apparent, when we consider that the worker formed it as a trap for flies and other winged insects, and not for an architectural exposition.

The spider begins its web by stretching a line tight across the space where it is to be built; then it fastens another from the centre of this single line to some object lower down; continuing this with an accuracy that is remarkable, it fixes and stretches its threads consecutively until it looks like a wheel with many

spokes. This is the foundation, or frame work, which has still to receive its circular strands. These are put on one after the other with a quickness that is surprising, and almost before we can realize it the whole structure is complete and ready for its victims.

Such, briefly, is the manner in which a spider's web is constructed, and now we are ready to treat of its delineation by the camera and plate. .

There is no set time when this can be done, as, unless under very exceptional circumstances, the web can only be pictured successfully when certain atmospheric conditions have prepared it for the photographer.

The spring and fall months are the best to look for these conditions, and even in these, years may elapse before we can be fortunate enough to find an hour suitable for picturing our dainty and fickle subject.

The only time is early in the morning, when the cool air of night has acted on the warm earth, or the cold earth and warm air have combined to form a mist or fog that leaves its moisture on every leaf, and forms myriads of drops on the filmy strands of web that hang quivering in the almost breathless air.

It is then that we must hurry to catch the impression ere the sun's rays dry up the countless drops of moisture which have enlarged the strands of the web to a size that enables the eye to note their construction, and without which we should have to use a magnifier to see the lines at all.

There are two important factors in this work, which, if well chosen, will lead to ultimate success. These are moisture on the web, and the proper background. The first we shall have to leave to Nature; the other Nature leaves to us, though we may frequently have to humor her, when selecting our point of view, for it often follows that the only available standpoint will give the sky or, for a background, what is equally bad, a blotchy mass of sky and foliage, with the latter out of focus. We must try to avoid such positions; but should circumstances render it impossible to do so, we will have to seek refuge in artificial backgrounds. A focusing-cloth, a few branches cut from another tree, or even a sheet of dark paper will suffice. In placing these, on no account should we disturb the moisture on the web we are to picture. The slightest shake at this time will send its beauty to the ground in an instant; for, as stated before, its photographic possibilities rest in the tiny drops of water which have settled there from the descending mist.

We have now called attention to what we deem are the ideal conditions, and shall at once proceed to tell how to utilize the opportunity when these conditions exist.

The worker is not called on to provide any special appliances in this branch of Nature photography, other than a good, rigid tripod clamp and a lens working at full aperture — the former to carry the camera at any angle we may wish, and hold it there; for it is needless to say we shall have to picture our webs from the low grasses in the fields up to the topmost branch of a good-sized tree, hence the necessity for means to elevate and depress the camera as the situation demands.

JOHN BOYD SPIDER'S WEB COATED WITH DEW

A lens working at full aperture is an invaluable aid, inasmuch as the exposure must be short, owing to the constant and almost unseen quivering of the subject, and the weak light which prevails at so early an hour, the sun being not more than a few minutes above the horizon. These conditions are usually accentuated by the mist or fog, which rarely lifts until the sun has warmed up the air.

The exposure to be given is a difficult question to answer properly, as we have to strive to attain two distinct objects in considering it. First, we must eliminate all motion; and in the second place get as much detail in the surroundings as is possible. The first is not so difficult, as one fifth to one tenth of a second will give a sharp image, unless the breeze is very strong; these exposures will also suffice for the web itself, which is fairly actinic, but the details in the trees or grasses will suffer if the light is poor. Still, there is no help for it, and we shall have to be content to let the web image predominate, with all the other surroundings subservient to it.

A non-halation orthochromatic plate of the fastest speed is the best to serve us in this class of work, and a weak pyro-soda developer seems best adapted to bring up an image as near to the original as photography can make it.

If you have not an orthochromatic plate handy, a fast non-corrected one will do nearly as well, but the first-named seems to answer best for foggy weather, as it certainly does for distant scenes with their intermediate haze. On no account should we voluntarily use a plate that is not backed or double-coated.

JOHN BOYD SPIDER WATCHING HIS PREY

The backing-medium is so easily applied, that there is no excuse for the worker making a second-class negative when, by a little extra effort, he can have the best definition and the truest effects by coating his plates with one of the many mediums now on the market. I consider the use of plates prepared in this way as essential to success in araneous photography as with interior or night scenes by artificial light.

If our results are to be used for "record" work, and I believe most of them will be, we had better print on glossy paper. Solio or Self-Toning for daylight printing, and Velox, Cyko or Argo of the development class, will all define the details with an accuracy that is satisfying, so that if the focusing, exposing and developing is carried out intelligently, the results will bear inspection under the magnifying-glass, showing up in a wonderful way the beauty that lies hidden from the naked eye.

The reader is now invited to probe the mysteries of the web, feeling sure that there is no danger of getting "tangled" in its meshes. The "sticky" spots catch only those who are hasty and pay little or no attention to that which is before them.

AGNES TOMLINSON A DISPUTED RIGHT OF WAY

KODAK EXHIBITION

A TRIUMPH IN KODAKERY

WILFRED A. FRENCH, PH.D.

THE old adage that a thing worth the doing should be done well is illustrated in an eminent degree in the case of the itinerant exhibition, with its attendant lectures and technical demonstrations, now being accorded the principal cities of the United States by the Eastman Kodak Company. A reference to this enterprise, together with a suitable editorial, appeared in the last issue of this publication. We commented in terms of praise upon the character and excellence of this extensive display of pictorial photography, as well as to the profound and wholesome impression it left upon the minds of the community privileged to see it. It is a matter of congratulation that the parties who have projected and are financing this great enterprise are not obliged to weigh the cost, which is, of necessity, very considerable. They have opportunities that are unexcelled, if, indeed, they are not unprecedented, for collecting rare and valuable material from every quarter of the globe, from which to form a convincing demonstration of the possibilities of practical photography. Hence the spectator is impressed by the extraordinary range in the

H. B. CONYERS
THE LEMON
KODAK EXHIBITION

choice of subjects, which include scenes of uncommon interest from every clime, from the ice-bound shores of Prince Rudolph's Land to the heart of tropical Africa. The collection abounds in pictures of strong artistic appeal and pictures that speak directly to the heart. No wonder, for the best skill in the photographic world is here worthily represented. We find the names of such well-known pictorialists as Annan, Davison, Hinton, Stirling, Leduc, Alfieri, Myra Wiggins, Pringle, Steichen, Benedict, Stieglitz, Emma Farnsworth, Cline, Nellie Coutant, Nancy Cones, Eickemeyer, Agnes Tomlinson, Dr. Dixon (the distinguished lecturer of the Eastman Kodak Company) and many others. A remarkable series of three enlargements from Panoram Kodak negatives by Anthony Fiala reveal the true character of the icy North, latitude 81°, and a high standard of pictorial beauty, commanding general and profound admiration. Among the many technical achievements on view, we instance "Feeding-Time," by Dorothea Seton — a good-sized enlargement with perfect proportions and sharpness of detail, made from a Brownie negative.

This notable collection is made up of about three hundred enlargements by the bromide process, a grateful medium for revealing the artistic character of the photograph; yet whenever an exposition of detail is deemed of supreme importance, it is in evidence. The high character of the enterprise so impressed the art critic of the *Boston Transcript*, William Howe Downes, that he not only visited the exhibition repeatedly, but made it the subject of special articles in his paper. The most popular feature, however, was the daily illustrated lecture by Dr. Joseph K. Dixon, one of the best-equipped speakers on the lecture platform to-day. An eminent Bostonian volunteered the declaration that Dr. Dixon was a worthy successor to John L. Stoddard, than whom America never had a more brilliant and successful lecturer — high praise, indeed, and well deserved. It is with a powerful combination of pictures and oratory such as this, that the Eastman Kodak Company is making fresh conquests, yielding results that are bound to be of permanent value. From an educational standpoint this exhibition, with its accompanying lectures and demonstrations, has already proved of inestimable value to the throngs who have visited it. As a means of deepening the interest in photography and increasing the demand for cameras and photographic supplies, the Kodak Exhibition is an overwhelming success; the dealers can testify to that. In the "Notes and News" of this issue will be found the itinerary of the Eastman display, which, with all its original features, will appear in the cities as advertised.

DREAM ON

WILDIE THAYER

HOPE on, dream on, ambitious soul,
And never greet despair;
'T is better to build castles
Than dungeons in the air.

ON THE USE OF ALUMS IN COMBINED TONING AND FIXING BATHS

THOSE untiring investigators A. and L. Lumière and Seyewetz have recently conducted a very interesting series of experiments on the use of alums in combined toning and fixing baths, and the comparative values of chrome and ordinary alum when used in such solutions. The results of these experiments, as published in the *Marseille Revue Photographique* for October, we have summarized below.

As is well known, common alum is used as an ingredient in combined baths, its object being to harden the film of gelatine prints. The quantity usually employed for this purpose produces only an imperfect hardening, and the gelatine surface of the prints being liable to soften, the bath must, therefore, be considerably cooled when used during hot weather or in tropical climates. The ordinary method of preparing the combined bath, which is to add alum to a hot solution of sodium hyposulphite, was found, in the course of the experiments above mentioned, to be in a large measure responsible for the inadequacy of the hardening-process, because of the precipitation of the major portion of the aluminium contained in the alum.

On the other hand, if the solutions were cold, both aluminium and sulphur were precipitated, the latter due to the decomposition of a portion of the sodium hyposulphite by alum. It was discovered, however, that sodium bisulphite possessed the quality of rendering this decomposition practically negligible in a cold solution, so that a perfectly clear bath might be obtained. It then became a question as to the relative hardening-qualities of chrome and ordinary alum, and experiment showed that ordinary alum produced the most perfect insolubility of the gelatine film of the paper. While ordinary P. O. P., toned and fixed without hardening, will not resist a temperature greater than 95° F., it was found that with chrome alum added to the bath the temperature might safely be raised to 140° F., or with ordinary alum to 176° F. The maximum hardening-effect was obtained by adding, to the usual toning and fixing bath, about eighteen grains of common alum per ounce of solution.

Furthermore, it was ascertained that the largest quantity of sodium bisulphite which could be introduced into a combined bath containing this amount of alum, without any detrimental effect, was about five minims of sodium bisulphite to the ounce of solution. After repeated trials, in which the relative proportions of alum and bisulphite were systematically varied, Messrs. Lumière and Seyewetz have adopted the following formula:

Water	20	ounces
Sodium hyposulphite	5	"
Sodium bisulphite lye	100	minims
Acetate of lead	20	grains
Common alum	400	"
Chloride of gold	6	"

PORTRAIT BY GEORGE G. HOLLOWAY, TERRE HAUTE, IND.
P. A. OF A. SALON

In this solution prints tone a little more slowly than in ordinary combined baths, but air-bells are avoided, the bath remains clear and moderately warm water may be used for subsequent washing, resulting in a saving of time, not to be despised.

It may be well to say a word here regarding sodium bisulphite lye or the liquid forty per cent (commercial) solution of acid sodium sulphite referred to. The preparation is much used in Europe, but if any difficulty is experienced in procuring it, it may be prepared in accordance with the following formula:

Sodium sulphite anhydrous .....60 grains
Pure sulphuric acid .....13 minims
Distilled water to .....1¼ ounces

This is equal to one hundred minims of the acid sulphite lye.

SOLITUDE

WILDIE THAYER

LIKE a hermit of the wood,
Stands a tree in solitude;
Widely do its branches spread
For a canopy o'erhead.
In its arms, sweet song-birds nest;
In its shade, tired travellers rest;
Noble, grand, protecting, free,
Is this solitary tree.

King of trees, apart it stands,
Monarch of the forest lands;
To perfection has it grown,
Stronger, that it stands alone.
Solitude has been its friend,
Bidding it aspire, extend.
It could not so mighty be
Were it not a lonely tree.

Storms may beat: it firmly stands;
Outward reaching it expands.
Smaller growths cannot intrude
On its royal solitude;
Calm, courageous, strong, upright,
Facing ever toward the light.

Lonely soul, to Nature turn;
From this tree a lesson learn.

THE OZOBROME PROCESS

THE method of "chemical printing" invented by Mr. Thos. Manly, of the Ozotype Company, has been before the photographic world only three months, and yet, so far as we can judge, has not yet aroused the interest which would have been anticipated from its remarkable character. It would seem that the process is such a complete revolution in methods of photographic printing that experienced printers are inclined to dismiss it without investigation of its powers by a series of practical tests. Ozobrome, however, as we were the first to assert, is no freak process or *tour de force*, but a method — of extraordinary simplicity — possessing facilities which must surely prove tremendous advantages in the eyes of both professionals and amateurs.

In the first place, ozobrome yields a carbon (pigment) image indistinguishable from a carbon made in the ordinary way.

This carbon print is made directly from a bromide print or enlargement, and it is unreversed.

The printing (in the dark) of the carbon from the bromide is done in about the time required for daylight exposure.

The bromide, after use, may be restored to its original condition. The whole series of operations is performed in broad daylight, or by any artificial light that may be preferred, and may be mounted and finished.

To the amateur worker who has not the opportunity of daylight for a large proportion of his work these facilities require no comment or emphasis. The professional photographer or trade enlarger can hardly help regarding the process with special interest from the point of view of lessening the cost of reproducing carbon enlargements. Hitherto an enlarged negative has been indispensable, and in contrast with ozobrome the cost of the materials may be compared thus:

15 x 12 Enlargement via Enlarged Negative

	s.	d.	
Contact Transparency, say	0	2½	$0.05
15 x 12 Negative Plate	1	6	.36
	1	8½	$0.41

15 x 12 Enlargement via Bromide

15 x 12 Bromide	0	6½	$0.13

The cost of "printing" ozobromes from the bromide should be less for labor than in making carbons by the ordinary method, and would compensate for the slightly increased cost of the ozobrome tissues (pigment plasters) compared with ordinary carbon tissue.

The figures given above leave out any value of the bromide print, although, of course, a considerable sum might be obtained for it either in its raw state or worked up. It is to be expected that one bromide enlargement, in conjunction with one or more carbons of the same size, will become a stock line among photographers; but in any case it is to be hoped that the profession will make the

PORTRAIT BY GEO. J. ROGERS, DETROIT, MICH.
P. A. OF A. SALON.

lessened cost of production the opportunity of extracting a larger profit from such extremely "cut" specialties as carbon enlargements.

THE REV. H. W. DICK ON OZOBROME

On September 26, the fixture at the North Middlesex Photographic Society was the Ozobrome Process, demonstrated by the Rev. Henry W. Dick, of Manchester. Mr. Dick, who has several times lectured before the society, was met by a large audience, who fully appreciated the opportunity of witnessing the demonstration of Mr. Manly's fascinating process. Many other photographers would doubtless have been glad to have attended had the occasion been announced. The demonstration was, however, arranged at short notice, Mr. Dick kindly consenting to devote an evening to the subject in his passage through London for a brief holiday in Normandy.

He explained that the whole of the preparations for the demonstration had been made for him by others, and that therefore the success (or failure) of the proceedings was not to be credited to himself. The demonstration, however, was completely successful.

The lecturer explained that the basis of the process was the contact of a bromide print with a piece of carbon tissue, or pigment plaster, as Mr. Manly called it, this contact producing the effect of light, and giving rise to a print which was to all intents and purposes a carbon. The bromide was bleached during the course of the process; but it could be used again and again if desired, or it might be made the basis of the carbon print, in which case certain advantages were obtained. In both cases the bromides should be good prints, fully washed to free them from hypo, the presence of which would unfit them for the process. The reason of this was that the solution with which the carbon tissue (pigment plaster) was impregnated contained ferricyanide of potassium, which, with any hypo in the print, would form Farmer's reducer, and so destroy the silver image of the bromide in places. The gelatine film of the bromide should also be hard, in order that it might not soften under the action of the hot water used for development. The prints could be treated with a ten per cent solution of formalin, but it was not absolutely necessary to use this bath, though probably advisable to do so, unless the prints were to be dried before being placed in contact with the treated tissue (pigment plaster).

The bath in which the tissue or plaster was immersed prior to contact was called by Mr. Manly the "pigmenting-solution." It consisted of potassium bichromate, potassium ferricyanide, alum and citric acid. The solution was prepared and placed on the market by the Ozotype Company, though the lecturer believed that in the event of the secret of its preparation being lost he could resupply it.

The solution as purchased was mixed with four or less times its bulk in water. The stronger the bath, the more quickly the transfer of the bromide image to the tissue would take place. However, an average formula would be as follows:

Stock solution	2 ounces
Water	8 "

The tissue was placed in this solution, and at once swabbed all over on the gelatine side in order to remove air-bells and obtain a complete action of the solution. A minute or two was sufficient for the process, the only action of which was to impregnate the tissue with the solution. The bromide print was soaked in clean water until flaccid, and the treated tissue then removed direct from the pigmenting-solution, and brought at once face down upon the picture side of the bromide print lying face up in the dish. The bringing into contact of the two prints must be done smartly, as the action of the solution adhering to the bromide commences at once. The pair is removed (in contact) from the water and immediately laid on a piece of glass, the bromide underneath. A few strokes of a squeegee are quickly applied to remove excess of the solution, and the double paper laid under slight pressure — e.g., a sheet of plate-glass about one-quarter of an inch thick, and somewhat larger than the print — for about twenty-five minutes or half an hour.

The pressure on the prints should be even; if it is greater at one point than another there is likely to be a line showing in the final ozobrome print. But a pile of prints of the same size may be laid together under pressure without any evil results.

The contact between the prints and the tissue is only of service whilst the two are wet. If the time is so long that the tissue or the bromide print dries, the action comes to a stop. Mr. Dick could not say whether the action would take place more quickly if the print and tissue were laid under pressure together in a warm, moist place, but he was inclined to think that there was likely to be little advantage in this direction, as the tissue would adhere permanently to the bromide print on moderate elevation of the temperature, and therefore the preferable form of the process in which the final ozobrome is obtained without the presence of the underlying bromide image could not be carried out.

Clean water must be used for each bromide print — that is to say, the water must not be contaminated with the drainings from the bichromated tissue, or the print will commence to bleach before it is in proper contact.

In regard to the time during which a print should remain in contact, the lecturer said that it was difficult to over-print, but the temptation to cut down the time of contact should be resisted. In making a number of prints, no time was wasted, and twenty-five minutes could be given to each print.

This first process was preferred by Mr. Dick on the ground that when certain modifications — not suggested or authorized by Mr. Manly — were made, the richness of the final print was greater than by the other process, and afforded facilities for remedying defects in negatives which were very valuable. Nevertheless, the second process, in which the pigment print is obtained, supported on single transfer paper, the bromides being liberated for repeated use, was the one which the lecturer advocated for regular work. The method of employing process No. 1 is as follows: The bromide prints and tissue (pigment plaster), after twenty-five minutes' contact, are placed together in warm water, about 100 deg. Fahr., or, say, about as hot as the hand will bear. The paper support of the pigment film

then becomes loose from the solution, in the hot water, of the soluble gelatine film, and can be stripped off, leaving the pigment image on the surface of the bromide print. Development is done in the usual carbon manner by laving hot water over the surface of the print, and removing to a dish of cold water when finished. The print now consists of a complete pigment print, with a bleached or partially bleached bromide underneath. This latter can be employed in several ways:

1. It may be removed altogether by the Farmer reducer.
2. It may be redeveloped with any developer.
3. It may be darkened with the ordinary soda-sulphide solution used in the sulphide toning-process.

The first of these procedures will be adopted if the print leaves nothing to be desired as regards vigor. If, however, it lacks strength, the application of either solution — developer or soda sulphide — will improve it.

In either case, it is a curious thing that more detail is shown in the ozobrome print than is visible in the original bromide. In fact, according to Mr. Dick, this is the case even if the bromide image is altogether removed. It is suggested that some invisible constituent of the bromide comes into play in the ozobrome process. It is sometimes found that in ozobrome, as worked according to this first method, the resulting ozobrome may be flat, apparently due to some scattering effect of the lights in the subject. The addition of a little alkali (ammonia) to the pigmenting-solution will remedy this, and is a great advantage in preparing ozobromes from flat prints. The quantity of ammonia may be about ten minims of ten per cent solution of ammonia to about eight ounces of pigmenting-solution. Addition of potassium citrate would give the same result, the lecturer stated, but he was unable to say whether its action was due to any alkalinity of the compound, or whether a neutral citrate would give the same results as ammonia.

In the case of subjects with too much contrast (in the bromide print) a little acid added to the pigmenting-solution would remedy matters.

The second method of ozobrome was described as that which would be adopted for regular work, as it was independent of a bromide image underneath. It was as easy to work as the former. The first part of the procedure is the same for both methods, the print and treated tissue being placed in contact, while wet, for about twenty-five minutes. Instead of developing at once in hot water, the tissue and bromide print in contact are laid in *cold* water and the bromide print pulled off, the two being under the water while this operation is performed. A piece of single transfer paper, which has been soaked in water for a few minutes, is then brought face down on the exposed surface of the tissue and the two removed together from the water. They are squeegeed in contact and laid under a weight, such as a piece of plate-glass, for a quarter of an hour. The pair are then placed in hot water and developed in the usual way, already described for the first process, being finally soaked in cold water, and given a brief bath of alum and a final wash in water.

Mr. Dick showed a number of prints made by both variations of the process,

PORTRAIT BY BELLE JOHNSON, MONROE CITY, MO.
P. A. OF A. SALON.

and stated that the three prints by himself in the Royal Photographic Society's Exhibition were ozobromes.

The very greatest interest was manifested by those present in the process, which, it was acknowledged, fulfilled all the claims which were made for it, remarkable and almost incredible as some of those claims were. The advantage of the chemical printing of the copies without light and of the non-reversal of the prints was commented upon, and Mr. J. C. S. Mummery, in proposing a vote of thanks to Mr. Dick, expressed the hope that good use of the process would be made by members in the weeks which remained before the opening of their exhibition.— *British Journal of Photography.*

OFFICIAL INSTRUCTION FOR OZOBROME

Since the publication of the first directions for the working of Mr. Manly's process, the following additional notes have been issued by the Ozotype Company, supplementing the directions appended to the article by Mr. Foxlee, which appeared in our September issue.

It is possible that one part of the concentrated pigmenting-solution to five parts of water may not be strong enough to completely bleach a deeply printed enlargement. Perhaps one part of concentrated solution to four parts of water might be considered as the average strength of the pigmenting-bath. This strength will keep better than one part to five parts of water.

In Method No. 1 the bromide picture should be printed with a white margin of about a half-inch all round, to serve the purpose of a safe edge, so as to prevent the edges of the picture from frilling during development.

In contact-printing the margin formed by the rebate of the printing-frame is generally sufficient, but in making enlargements the margin of the bromide paper should be protected. This may be effected easily in the following manner:

Take a sheet of cardboard the size of the bromide paper (the strawboard packed with the sensitive paper will answer admirably), paste or glue strips of thin cardboard or stout paper of any color along each edge of the card, allowing about half an inch of the paper to project from the edge. When dry, turn the half-inch edge over the card, so as to form a kind of sheath, such as is used for carrying plates in some magazine hand-cameras, but, of course, with four edges protected. You have now a very handy contrivance, which will be serviceable always. When about to expose, slide the sensitive paper into the sheath by unbending one side and replacing it. Adjust on the easel by pinning through the card.

In Method I., the bleached image beneath the carbon picture may be redeveloped partially or entirely, and this may be made use of in various ways. For instance, a weak bromide may be converted into a strong print by reblackening the underneath image, and many beautiful effects may be secured by causing the redeveloped silver to modify the tone of the semi-transparent carbon picture.

If a weak developer be applied with a brush, local intensification may be effected, and a sky which is hardly strong enough for the rest of the picture may be made heavier in this way.

The underlying image may also be toned by the various bromide toning-solutions.

Of course, the developing or toning solutions must be removed by washing for about fifteen minutes.

The redeveloped silver image, being protected from the atmosphere by a layer of hardened gelatine, is naturally much more permanent than an ordinary bromide print.

MATERIALS FOR THE OZOBROME PROCESS

The necessary materials for working the process are now put upon the market by the Ozotype Company, 1 Weedington Road, Kentish Town, London, N. W. They are, first, the "Ozobrome Pigmenting Solution" and second, the "Ozobrome Pigment Plasters and Transfer Papers." The solution is put up in four, eight and twenty ounce bottles, in concentrated form, being diluted for use with four to six times its bulk of water. The bottles cost $0.32, $0.48, and $0.56 respectively. The pigment plasters are supplied in twelve colors, as follows: engraving black, warm black, blue-black, sepia, warm sepia, portrait brown, terra-cotta, Van Dyke brown, red chalk, marine blue, sea green and Italian green. They may be had either in bands thirty inches wide and twelve feet in length, price $1.68, or in cut pieces, these pieces being slightly larger than the regularly listed sizes, for convenience in working. Four kinds of transfer paper may be had; viz., fine, white smooth, medium grain matt, white etching and toned etching, the price being $0.90 per band. We have published these prices in order that our readers may see that the process is not an expensive one. A bromide print, a squeegee, some of the Ozobrome solution, pigment plasters and transfer paper are all that is required for working it. In fact, a supply of the necessary materials for $3\frac{1}{4} \times 4\frac{1}{4}$ work can be secured for about $0.60.

The Ozobrome pigment plasters and carbon tissue have been spoken of in the accounts of this process in such a way that one might suppose that the terms were synonymous; but it may be well here to explain that there are marked differences between ordinary carbon tissue and that which has been placed upon the market for Mr. Manly's new process. The chief difference lies in the fact that the Ozobrome plasters contain a much smaller proportion of gelatine than the tissue employed for ordinary carbon work. As this difference is an important one in the process, those who wish to avoid difficulties will do well to employ the particular materials which Mr. Manly has found to be most suitable.

BEFORE THE TEMPEST

ISABELLA HOWE FISKE

A THREATENING bar of storm-cloud
  Hangs over darkening seas
That seem to shudder under
  Its sword of Damocles.

R. DUEHRKOOP.

THE CHILDREN'S THANKSGIVING DINNER.

EDITORIAL DEPARTMENT

THE P. A. OF A. SALON

WE reproduce, in this issue, for the benefit of our readers, several of the pictures taken from the Salon of the P. A. of A. Convention, held at Niagara Falls, N. Y., in August last. These pictures are of interest as showing the high-water mark of cultivated mind in professional photography in this country to-day. We do not presume to pass judgment upon these pictures as final, but one looks in vain for the great masterpiece in this collection that is to revolutionize professional photography in America. By a singular coincidence there were exhibited at this convention the amateur photographs of The Second American Salon, and we believe that, without disparagement to professional photography, the professional can learn much from these pictures of the amateur — not because of any superiority of work on the part of the amateur, but simply because he has gone about his work in a different way and has emphasized certain truths that are necessary for success in picture-making. For example, the prevalence of the soft-focused picture, in the amateur Salon, gives, undoubtedly, a greater illusion of atmosphere and of light. It is a decided gain for the picture. It eliminates all fine lines and blurs the coarser ones, but preserves, in subordinating these details, the artistic effect of the photograph. The professional focuses sharply and reaches the same result by retouching his negative, which oftentimes destroys or impairs the character and likeness of the photograph. In defence of his position, on the soft-focused question, the amateur photographer will tell you that the greatest portrait-painters, since the days of the Renaissance, have always used it when the art of painting had certainly reached its greatest development. The amateur studies the painters, and we believe that he is without doubt right in this respect.

Another excellence in the amateur work to which we would call attention is his method of illumination: his accessories are simpler, he depends more upon natural lighting, and in this the painter agrees with him. Only one light, as a rule, and never more than one source of reflected light, is a safe rule to follow. The use of backgrounds is a mistake, especially when they are obtrusive or so insistent that they jump out at you from the picture. The question of tones in a photograph is oftentimes a mere matter of taste, but the amateur photographs gain greatly in charm over the professional by the taste which they show in the use of tones in the pictures. To sum up the great lesson of the amateur photographer to the professional, it is embodied in three words,— study the painters. We therefore recommend to our professional readers a careful survey of The Third American Photographic Salon which is about to be opened in New York. We believe that it will help them to a larger appreciation of the possibilities of their profession.

ART

SOME great writer has said that art is the beautiful way of doing things, and again that art is only the expression of a man's joy in his work. In his autobiography, Herbert Spencer speaks with no uncertain sound on this subject of joy in work. Certainly if one cannot take pleasure in one's work the work will not be good for much, because artistic work is the expression of pleasure. It does not follow, of course, that there is not pain and toil in any search for excellence, but the outcome must mean joy ultimately or the work fails of its purpose. We do not sympathize much with that form of asceticism which makes it a wrong to do a thing for the pleasure of doing it. We believe that so long as no injury is inflicted upon others nor upon one's self, and so long as the various duties of life have been properly discharged, the pursuit of pleasure for its own sake is perfectly legitimate and requires no apology. The opposite view has been recently styled "a remote sequence of the old devil-worship of the barbarian, who sought to please his god by inflicting pains on himself, and believed his god would be angry if he made himself happy." The photographer who works in this spirit, crudely, perhaps, but with intelligence and joy, will make pictures out of the ordinary because impelled by a fine instinct for workmanship. Morris, the poet and idealist, considered labor not at all as a curse, nor as a punishment for disobedience, nor as a material commodity, subject to exchange and barter, but only as an expression, a medium, for feeling, sentiment and imagination. For want of a better word we call the product of photography, under these conditions, art-craft — a term signifying the central fact in the Arts and Crafts movement of to-day, the romantic union of art and labor.

THE PHOTO-ERA

AT this season of the year the majority of people are making their selections of magazines for the coming year. Every one who is interested in photography should take a photographic magazine to learn the latest and most up-to-date methods and appliances in this great art science. Many amateur photographers do not take a photographic magazine because the matter is not properly presented to them, or because they are not acquainted with a good magazine. We publish the best photographic magazine in America. PHOTO-ERA, the American Journal of Photography, is recognized by common consent to be at the head of the procession. No other magazine in its class can be compared with it for up-to-date, thorough and carefully prepared articles on matters relating to art and photography in all its branches. No progressive photographer can afford to be without it. We invite the attention of our readers, this year, to the splendid offers made elsewhere in our pages, in combination with the other leading publications of the country. The opportunity to secure the best periodical literature that the country affords, at bargain prices, is greater now than ever before. We trust that all our readers will be able to take advantage of this great opportunity, and will send in their renewals before these generous offers are withdrawn. Do it now!

THE ROUND ROBIN GUILD

Conducted by Elizabeth Flint Wade. Specially designed for the amateur photographer and the beginner. Membership may be obtained by sending name and address to the PHOTO-ERA.

Do you know Dickens's description of November?

No? Then listen, and you shall hear it.

"Fog everywhere. Fog up the river, where it flows among the meadows; fog down the river, where it rolls among the tiers of shipping, and the waterside pollutions of a great city. Fog on the marshes, fog on the heights. Fog creeping into the cabooses of brigs; fog lying out on the yards and hovering in the rigging of great ships; fog drooping on the gunwales of barges and small boats. Fog in the eyes and throats of old pensioners wheezing by the fireside of their wards; fog in the stem and bowl of the afternoon pipe of the wrathful skipper, down in his close cabin; fog cruelly pinching the toes and fingers of his shivering little 'prentice-boy on deck. Chance people on the bridges peeping over the parapets into a nether sky of fog with fog all around them, as if they were up in a balloon and hanging in the misty clouds."

Is n't it a vivid picture of our November days — days of fog and mist and clouds, days which seemingly offer no opportunity to the amateur to pursue his favorite avocation?

But listen, these November days are just the days when one may secure some of the most artistic effects which his camera is capable of producing. Fog, though it seems almost impenetrable to the eye, has really a great deal of luminosity. Consequently, the amateur who is oblivious to the weather may encase himself in mist-proof coverings and, sallying forth with his camera, may succeed in getting those atmospheric effects which are so skillfully portrayed by the artist of the brush but so seldom attained by the artist of the lens.

November, then, is the month when, especially along the shores of lake and ocean and water-course, or low-lying meadows, and even in the city streets, one should seek for and find picture conditions not to be found in any other month of the year. This coming year one of the subjects is to be pictures taken on foggy or misty days, so be warned in time and make the most of the hours of the short November days.

BROMIDE PAPERS

The quick printing gaslight papers, with their varying degrees of speed, their soft and their contrasty effects, have almost driven out of the market the old-time bromide paper. But there is a reaction, and there is to-day on the market a very beautiful bromide paper capable of producing most delightful effects, equal to the most careful daylight printing. It is a slow paper, and develops up into clear, velvety blacks and pure soft whites. Being a slow emulsion, one has great latitude in exposure, and by using a slow developer the picture is entirely under one's control. The most satisfactory developer for this paper is the eiko-hydrochinon. The formula for this developer is as follows:

Solution 1

Water	10 ounces
Sulphite of soda	2 "
Eikonogen	165 grains
Hydrochinon	80 "

Dissolve and add enough water to bring the solution up to sixteen ounces.

Solution 2

Water	10 ounces
Carbonate of potassium	1 ounce
Carbonate of soda	1 "

Add enough water to bring the amount up to 16 ounces.

To develop, take an ounce of each solution and add six ounces of water. Place the bromide print face down in a tray of clean water until the surface is thoroughly wet. Remove and place face up in a porcelain tray and flood with the developer. Rock the tray gently until the print has reached the right stage of development, rinse and place in a fixing-bath of one ounce of hypo to eight of water.

One may develop a print locally, bringing out some portions more and holding others back or leaving them out entirely. To do this first wet the print as directed, then place in a tray of very weak developer until the detail begins to come out enough so that one can distinguish the outlines easily. Remove from the tray, rinse in several changes of water, then lay the print face up on a sheet of glass and with a soft camel's-hair brush about an inch in width use strong developer and paint over the places which it is desired to bring out and leave the rest untouched.

One brand of this bromide paper is coated on a heavy yellow-tinted paper, and when developed and toned in an alum bath has the effect of an old engraving, especially when the picture has fine detail.

The picture, after being developed, is toned in an alum bath made after the following formula:

Hyposulphite of soda	2½ ounces
Powdered alum	½ ounce
Granulated sugar	½ "
Water	18 ounces

Heat the water to boiling-point and stir in the soda and alum and sugar. Have the ingredients thoroughly dissolved, then filter through filtering-paper and let the bath stand twenty-four hours before using. The solution has a milky appearance and can be used repeatedly. The print is first put into a cold bath of the toning-solution, then transferred to a hot bath of the same, having a temperature of about 135° F. Leave it in this hot bath until the desired tone is reached, then transfer to an alum bath made of one ounce of alum and sixteen ounces of water. Leave it in this bath for two or three minutes, then wash and dry.

Beautiful sepia tones are obtained in the hot bath, varying in depth the longer or shorter time the print is left in the bath.

This paper is so heavy that prints may be made with wide margins and will require no after-mounting.

THE TWENTIETH-CENTURY PHILOSOPHER'S STONE

There are very few young people who would not welcome an addition to their spending-money. Often one wants a few dollars over and above his allowance for some special purpose, for some coveted object just beyond one's available means. If this extra money can be obtained by one's own labor it is doubly appreciated and enjoyed.

Now the owner of a camera — though perhaps he has never thought so — has the "open sesame" to many doors of money-making denied to his companions who do not possess one of these magic boxes. A camera is really not unlike the fabled philosopher's stone, which was believed to turn everything it touched into gold.

What the eye of the owner of a camera sees the eye of the camera can catch and the sensitive plate perpetuate, and one can use his camera to catch such pictures as shall be of commercial value. It is a picture-loving age, and all the events of life are portrayed in pictures. The photograph, on account of the facility with which it can be made, is the choice *par excellence* of all methods of illustrating passing events. Therefore the wise amateur, keeping in mind the illustrative value of whatever scenes pass before his vision, and being armed and equipped with a pocket camera, can earn many dollars by taking advantage of the pictorial events which daily present themselves.

One thing which specially recommends the camera as a wage-earner is the fact that it can be used equally as well by girls as by boys. Girls have not so many

HANA ROBISON FIRST PRIZE

ways of earning money as have their brothers, but their wish for it is just as great, if not greater, than theirs.

Photographing of wild birds and wild animals, once considered as almost impossible and requiring great patience and great caution, has by the use of the telephoto lens become a very simple operation. Such pictures are always in demand, for it is only recently that the wild things of field and forest have been portrayed in their native haunts, consequently all such pictures have the merit of novelty.

Boys can take advantage of the popularity of these pictures and with patience and care make many excellent saleable prints. Girls have not the privilege of roaming woods and fields by themselves, so in the line of photographing animals it is necessary that they keep near home, confining themselves to the domestic animals. The most graceful animal, and one whose picture always delights, is the kitten. One young woman living in the South has been so successful in photographing kittens — of which she has quite a number — that she earns from ten to twenty dollars weekly by the sale of her pictures, disposing of them to illustrated

papers and also selling the daintily finished and mounted prints.

If one lives in a village, where there is less opportunity for making commercial pictures than in the city, try the making of pictures of people in their homes. One of the late ways of making pictures is to make several poses of the same person and print and mount them as one picture. This can be done by the amateur as well as by the professional. Suppose one should make several pictures of the house-mother, each one depicting some phase of her every-day life, print them in uniform style, and mount either in a folder or on one long sheet. It would be an advertisement of her skill which would, when exhibited, bring in many orders for Christmas work. Such pictures are highly prized as holiday remembrances, and one should not be modest about exploiting one's talent when it is needful to add to the income.

Though November days are short and dark, still there are many days on which negatives may be made, and the gaslight papers make one independent of sunshine.

MAUD S. LEE SECOND PRIZE

H. E. PARMENTER, U.S.N. THIRD PRIZE

Do you want a few extra Christmas pence? Then ask your camera how you may make them, and it will quickly answer the question to your great satisfaction.

The amateur finds his camera a very helpful friend when Christmas looms on the horizon and the question presents itself, "What shall I give to ——?"

The reason why the camera answers the query so satisfactorily is because the pictures have a personal interest, being always chosen with an eye to the receiver of the gift. There are many ways and one more in which one can utilize photographs to enhance the value of a Christmas gift. I know of a clever calendar which is now on its way to Manila. It is of heavy cardboard, in size 11 x 14, and near the top is cut an opening behind which is a stiff pasteboard pocket into which are slipped twelve photographs, one for each month in the year. Below the picture opening is lettered,

"If all the year were playing holidays,
To play would be as tedious as to work."

The one who is to receive the calendar

is a young civil engineer who went out to Luzon last summer, and each picture represents some member of his family busy at a familiar task. His father is busy at his desk; his mother, with work-basket and chair drawn before the fireplace where flames leap gayly, is doing the family mending; his sister is at the piano diligently practising her music lesson — and so on through the year. At the end of the month the upper picture is slipped out and placed behind the others and the next picture appears and holds the place of honor for the ensuing month. There is no doubt but that the recipient will welcome this gift as one of the choicest which he receives, and all it cost was a few shillings and plenty of forethought. The calendar is of course affixed just below the pictures, and on the back is recorded all the dates of the family birthdays.

While on the subject of Christmas gifts the editor wishes to make a suggestion in regard to those who at this season of the year are to be considered specially — the children in hospitals and orphan asylums. Children love pictures, and are very fond of pictures of animals. Whoever has pictures of pet cats and dogs could not make a more acceptable gift than to mount prints of them on cards, write on the back of the mount a little account of the pet and what it can do, and send to the children's ward on Christmas morning, or to the orphan asylum. It takes very little time or trouble, and it will bring cheer and pleasure to the poor children.

URANIUM INTENSIFIER

If one has thin negatives with good detail the best intensifier to make a strong negative is found in uranium. One of the well-tried formulas is made as follows: take eight ounces of water and dissolve in it, first, thirty-two grains of nitrate of uranium, and then thirty-two grains of ferricyanide of potassium. Add a few drops of acetic acid, put the negative to be intensified in a developing-tray, turn over it enough of the solution to completely cover it, and let it remain until the required density is reached. The solution will turn the negative yellow, but this color is eliminated by the after-washing of the negative. Do not wash in running water, but in several changes of water. This is one of the simplest and most successful methods of intensifying weak negatives; in fact, if this treatment does not produce the desired density one might as well throw away the negative.

ROUND ROBIN GUILD COMPETITIONS

First prize: Value $10.00.

Second prize: Value $5.00.

Third prize: Value $2.50.

Prizes may be chosen by the winner, and will be awarded in photographic books or magazines published or advertised by us; in enlargements, art portfolios of photogravures, mounts, or other photographic materials advertised by us; or, if preferred, we will send any article of a photographic or art nature which can be bought in Boston for the amount of the prize won.

RULES

Membership in the Round Robin Guild, with all its benefits — among which the correspondence privilege probably stands first — is free to all, and we invite every photographer to become a member. Entrance in the monthly competitions is also free to all, whether subscribers to PHOTO-ERA or not.

SUBJECTS FOR COMPETITION

October.— "Rainy Day Scenes." Closes November 30.

November.— "Harvest Scenes." Closes December 31.

December.— "Snow Scenes." Closes January 31.

AWARDS — MOTHER AND CHILD PICTURES

First prize: Hana Robison.

Second prize; Maude S. Lee.

Third prize: H. E. Parmenter, Lieutenant Commander, U. S. N.

Honorable Mention: Mrs. Chas. S. Hayden, F. S. Andrus, Fedora E. D. Brown, Miss Julia H. Elton, Lewis L. Emmert, Miss Jean S. Hutchinson, Edmund Jandrier, Chas. W. Jerome, Franklin I. Jordan, B. F. Langland, George

K. Muntz, W. S. Rice, John Schork, Wm. Spanton, R. E. Weeks, C. M. Whitney, Mrs. Eleanor W. Willard, Miss Emma L. Williams.

ANSWERS TO CORRESPONDENTS

GRACE M.— To remove silver stains from your negative place it for fifteen minutes in a twenty per cent solution of iodide of potassium. Rinse well and transfer to a solution of cyanide of potassium, using thirty grains to an ounce of water. If the stains are of long standing use stronger solutions, but the amount given will usually remove the stains. Use plate-lifters in handling the negative during the process.

B. M. T.— To finish self-toning paper in cool tones place the prints, without washing, in a solution of sulphocyanide of ammonium made of ten and one half grains of the sulpho-ammonium to ten ounces of water. Let them remain for five minutes; wash and fix in hypo bath of one ounce of hypo to fifteen of water. For warm brown tones place in salt water for five minutes, then fix, and wash.

JAMES R. L.— Yes; the monthly competitions which have become so popular a feature of the PHOTO-ERA will be continued. We shall give list of subjects for the quarter so that competitors will have ample time to prepare their pictures.

ALINE G.— Would advise you to try the gas light papers. They have been so much perfected during the past year that one has plenty of choice as to the kind of paper required for certain negatives. Many different emulsions are used, each emulsion being adapted to its own particular class of negative. A card to the manufacturers will bring you a catalogue giving descriptions of each paper.

SELMA L.— Use a plate-lifter in handling plates which are being submitted to the action of poison solutions. Mercuric chloride is a specially dangerous chemical to handle. One of the things which the careless amateur would find very useful on his darkroom shelf is a bottle of lime-water and sweet oil. It prevents the further burning of acids if applied immediately.

B. G. BARTON.— Persulphate of ammonia does not keep well in solution and should be mixed fresh each time it is to be used. You will find it one of the best of reducers, and with it one always has the negative under control. Full directions for its use have been frequently given in the pages of the Round Robin Guild. The prints you send are very artistic, and we should like to see more of your work.

F. G. H.— To clear a negative from pyro stain make up a solution of one-half dram of sulphuric acid, thirty grains of pulverized alum and ten ounces of water. Leave the plate in this solution until clear, wash well and dry. Sometimes the yellow stain on a pyro-developed plate adds to the printing-qualities, so before removing the stain try a print.

CELIA D.— You will find in the October number of the PHOTO-ERA, 1905, in the Round Robin Guild department, directions for finishing platinotype prints; that is, retouching them and taking out defects. This copy will be sent you on receipt of price, if you do not happen to have it easy of access.

ELLIS W.— To stop the toning of aristo prints place them after toning and before fixing in a stop-bath of salt and water, one half ounce of salt to sixteen ounces of water. Keep them in this bath five minutes, rinse and place in the fixing-bath.

H. F. D.— The prints submitted by you to the recent monthly contest were unmounted and only one of the prints marked with your name and address. All prints should be mounted, and each mount marked with full name and address of the sender, also the title of the picture and the subject of the competition for which it is designed. It was necessary for the receiver to mark all of your prints with the exception of the one, and as they were unmounted they were not easy to take care of. All photographs are handled with a great deal of care, and if our competitors would take a little more pains that prints are mounted and marked it would save a great deal of trouble at the office, and then there would be no danger of a possible loss.

LENS TESTING

To do this very thoroughly requires not only special apparatus, but also special knowledge as well. But for all ordinary photographic purposes this may be done quite easily by any intelligent amateur who will take reasonable care in making the various tests described under the following heads:

Achromatism.— Achromatism, when applied to a lens, means that the visual rays and chemical rays are brought to the same focus. If this be not the case, the lens is said to suffer from chromatic aberration. But if these aberrations or defects are properly corrected, the lens is said to be achromatic. A simple test for chromatic defects may be made by cutting a very narrow slit in the centre of a thin sheet of card or opaque paper. Let the slit be about three inches long. Cover up an inch at one end with a piece of ruby glass, cover up an inch at the other end with a bit of deep blue glass or gelatine and leave the central inch uncovered. Fix this paper to a clean window-pane facing north. Now set up the camera so that the axis of the lens is perpendicular to the plane of the wall in which the window is situated. Let the lens have its largest stop or largest aperture in use. Focus for the central slit, using a focusing-magnifier for the purpose, and examine the red and blue portions of the slit. If the lens is achromatic, the red and blue parts of the slit should be equally sharply defined. If an uncorrected or "spectacle" lens be used, and the red part be put into sharp focus, it will be found that the camera has to be racked inwards to get the blue part in sharp focus. As it is the blue end of the spectrum that does the chief part of our photographic work, we find that when an uncorrected lens is in use and we adjust the focus for a sharp visual image, the negative is not so sharp as the ground-glass picture. Hence, it is necessary when using these lenses, first to focus for a sharp visual image and then rack the lens inwards a distance about $\frac{1}{10}$ the focal length of the lens, if a sharp negative is required.

Astigmatism.— On a piece of white card draw two or three sharply defined ink lines an inch apart and six inches long. Then draw a similar set crossing the first at right angles. Now set up this card on a vertical wall and point the axis of the lens perpendicular to the wall, and arrange matters so that the image of the card falls towards one corner of the focusing-screen. Then with open aperture and focusing-magnifier focus one set of parallel lines as sharply as possible. If the lens suffers from astigmatism, it will not be possible to get both sets of lines quite sharp at the same time, though either set can be sharply focused in turn. If the lens is free from astigmatism it may be called stigmatic, orthostigmatic, anastigmatic, holostigmatic, etc.

Curvature of the Field.— Curvature of the field of a lens means that objects lying in one plane perpendicular to the axis of the lens are not brought to a focus in one plane. To test a lens for this, we fix up flat against a vertical wall a large sheet of newspaper, and arrange for the axis of the lens to be perpendicular to the wall and the lens pointing towards the centre of the newspaper. Using the lens at open aperture, we first focus for the centre of the ground glass and then examine the corners of the focusing-screen (using a focusing-magnifier). If the lens has a "flat field," then all parts of the ground glass should be equally sharply defined; but if it has a curved "field," then we shall have to rack in or out to get the various parts equally sharply defined. Usually we shall find that when we have got sharp definition in the centre of the ground glass, we shall have to approximate the ground glass to the lens to get the corners quite sharp, but with some

lenses we may have to increase the distance between lens and ground glass. Curvature of the field is by no means always a practical defect. Indeed, in many cases of landscape work it becomes a very useful quality. This is also the case with many architectural pictures. Practically it amounts to this: to get our foreground subject in equally sharp focus with open aperture, the subject-matter must not be all in one plane, but take the general form of a large shallow saucer with the concave side towards us.

It is not, however, generally desirable to push matters to their theoretical limit in the way here indicated, but with modern flat field anastigmats this point becomes one of considerable importance at times.

Distortion.— Distortion, when applied to lenses, means that the lens does not render straight lines in the original as straight lines in the negative. This defect is more readily seen when the straight lines in the original fall near the margins of the plate. Hence, when testing for this defect we use as our copy a map or plan, drawing sheet or printed matter, such as newspaper, which has a couple of parallel straight lines at such a distance apart that we can arrange for them to come fairly close to the margins of the focusing-screen. The lines separating the columns of a newspaper form a convenient test object. This should be fixed up flat against a vertical wall and the axis of the lens set perpendicular to the wall. The ground glass also must be accurately vertical, *i.e.*, parallel to the wall. Practically all single lenses show more or less distortion. The shorter the focal length (other things being equal) the more the fault is likely to be noticed. If the stop is in front of the lens, a rectangular original is bellied out at the sides to a barrel shape, but if the stop is between the lens and the plate the rectangle will have the middle of the sides drawn inwards, something like the margins of a square pincushion. Hence if two similar lenses of equal focal length be used with a stop between, the distortion of one is corrected by the other. Hence the idea of the rectilinear and symmetrical doublets now in common use. Except for maps or architecture studies, the distortion effect is practically negligible when the focal length is not less than one and a half times the long side of the plate.

Flare.— Flare is the result of a lens transmitting some light which is not brought to a focus on the ground glass to form the image of the object selected. The flare may be scattered all over the plate and produce a kind of general haze, or it may be visible as a more or less sharply defined disk or circle or light, or brought to a comparatively small patch or "flare spot." To test for flare, direct the camera and lens towards some dark object (tree, building, etc.), and at the same time arrange that some strong light or bright patch of sky or the sun is just over the dark object. Focus for the dark object and then move the camera about to see if any light patch is visible. If this be observed, then remove the back of the camera, and with a small piece of ground glass, moved towards and away from the lens, find where this bright cone comes to a point. Flare can often be best seen by focusing the opposite wall of a room at night, and putting a lamp on a table in front of the dark background. It is commonly supposed that single or "landscape" lenses have no flare; but as a matter of fact, every lens suffers more or less from flare. In a carefully made lens, it is negligible under all ordinary conditions.

Spherical Aberration.— Spherical aberration of a lens means that the outer portion of a lens does not bring the rays of light to the same focal point on the inner portion of the lens. To test a lens for this, first cut out of black paper a circular piece which just fits the inside of the lens tube. Then cut out of the centre a circular portion, and with a drop of water stick this on to the front of the glass so that light can only pass through the outer zone. Focus some small type very accurately in the centre of the ground glass. Then remove the central paper disc and replace it with the outer ring of the paper, leaving the central part, now clear. If the definition is equally good, as be-

fore, the lens is probably free from this defect. If, however, we find that spherical aberration exists — in other words, we find that the inner and outer parts of the lens do not bring their respective images to the same place — the result is that when both inner and outer parts are used together there is a sort of circular blur around each point. (For further details see our special number on Photographic Optics.)

There are, however, certain appearances at once visible which may here receive a word of explanation.

(1) *Color.*— It has long been known that many forms of glass undergo changes of color on exposure to light. Some kinds turn slightly green, others yellow. It is, therefore, desirable to keep one's lenses covered up as much as possible. The color of a lens may be seen by laying it on a sheet of quite wide note-paper. Of course glass that has turned pale yellow or green will not be quite so rapid as it was before it became colored.

(2) *Bubbles.*— The inexperienced photographer is apt to regard one or two tiny bubbles in the glass as serious defects As a matter of fact, their effect is practically negligible and may be disregarded. The peculiar difficulties in the manufacture of many of the newer forms of glass now used in optical work seems to favor the formation of these air-bubbles. But if the lens bears the name of a firm of repute, the purchaser may rest assured that these bubbles may be disregarded in practice.

Striæ.— Striæ, or line-like markings, unless of a very conspicuous nature, may also be disregarded in a lens by any good maker.— *The Practical Photographer Annual for 1905.*

FIXING-BATHS ACIDIFIED WITH BORIC ACID

R. Namias states that if boric acid is added to a fixing-bath till saturated, any possible troubles due to the introduction of small traces of developer are avoided; it is also much more effective than sulphite. A thirty per cent solution of hypo saturated with boric acid shows no decomposition, even after some weeks. With regard to the action of boric acid on hypo, Valenta has proved that the hypo *is* decomposed, but much more slowly than with a stronger acid.

FIXING IN DAYLIGHT

Luppo-Cramer states that plates may be fixed in not too bright daylight without any harm, but that in strong daylight or sunlight reduction of the silver takes place. He ascribes this to a sensitizing action of the hypo. The slower the plate fixes, the more the fog.

HYPO-ELIMINATORS

(1) *Dilute Iodine Solution.*— This instantaneously changes the hyposulphite into a quite innocuous compound, but it also has a tendency to form iodide of silver — *i.e.*, bleach the negative.

(2) *Dilute Bromide Solution.*— This also rapidly oxidizes the hyposulphite, but likewise acts upon the silver image.

(3) *Hypochlorites.*— The alkaline hypochlorites act readily on sodium hyposulphite, but if used at all concentrated they also act on the silver image.

(4) *Sodium Peroxide.*— This oxidizes the hypo only slowly if diluted, and if concentrated attacks the gelatine sufficiently to disintegrate the image.

(5) *Hydrogen Peroxide.*— This is an excellent hypo-eliminator, and has no bad action on either the image or the gelatine.

(6) *Chromic Acid and Potassium Bichromate.*— These, with the addition of sulphuric acid, oxidize hypo very readily, but also attack the silver image. Without the acid they are of no practical value, as the action is very slow.

(7) *Potassium Permanganate.*— This oxidizes and destroys hypo instantaneously, but exercises a very manifest action on the silver image.

(8) *Potassium Percarbonate.*— This acts energetically on hypo, but its action takes place only during the solution of the solid percarbonate in water.

(9) *Ammonium persulphite.* — This, mixed with an alkali, is an excellent eliminator of hypo, and is regarded as the best of those considered.

The Filter

TAKEN BY THE LORD

The Minister's Wife.— "The new cook left this morning, the one you said the Lord must have sent."

The Minister.— "Well, my dear, the Lord giveth and the Lord taketh away. Blessed be the name of the Lord!"— *Puck.*

NOT THERE

"Judge," said Mrs. Stoven to the Magistrate, who had recently come to board with her, "I'm particularly anxious to have you try this chicken soup."

"I have tried it," replied the Magistrate, "and my decision is that the chicken has proven an alibi."

NOT TRUE TO WOMAN'S ART

Mark Twain, while visiting a friend's house, was asked his opinion of a new marble bust representing a young woman coiling her hair.

"Very beautiful," said the humorist, "only it is n't true to life."

"Why not?" asked the owner.

"Has n't her mouth full of hairpins," said Mark.

A NEGATIVE

Reporter.— "Where shall I put this article about a police raid on a photograph gallery?"

Editor.— "Put it under the head 'Arrested Development.'"— *The Baltimore American.*

NOT FORMALLY INTRODUCED

Uncle Nehemiah, the proprietor of a ramshackle little hotel in Mobile, was aghast at finding a newly arrived guest with his arm around his daughter's waist.

"Mandy, tell that niggah to take his ahm 'way from 'round yo' wais'," he indignantly commanded.

"Tell him yo'self," said Amanda. "He 's a puffect stranger to me."—*Lippincott's Magazine.*

ONLY ONCE

The stranger strolled through the village streets until he arrived at the cemetery, says the old story. The grave-digger was hard at work excavating a grave. "Do people die often hereabouts?" asked the stranger. "None of 'em ever died more 'n once since my time," answered the grave-digger, wiping the sweat from his forehead with the back of his hand.— *New York Sun.*

NOT COMPOSING NOW

A few years ago, in Cincinnati, a musical was given in honor of James Lane Allen, the prominent novelist. A wealthy society woman of that town, somewhat limited in her knowledge of music, but anxious to pose as a patroness of music and art, rushed up to Mr. Allen and effusively exclaimed:

"O Mr. Allen, are you fond of Bach? Is Bach still composing?"

"No, madam," gravely replied the writer, "Bach is now decomposing."— *K. E. Marshall, in Lippincott's.*

A GERMAN, ADDRESSING HIS DOG, SAID

"You vos only a dog, but I vish I vas you. Ven you go mit the bed in you shust durn round dree times und lay down. Ven I go mit the bed in I haf to lock up the blace und vind de clock und put the cat oud und undress myself und my vife vakes up and scolds me. Den de baby cries und I haf to valk him up und down; den maype ven I shust go to sleep it 's time to get up again. Ven you get up you shust scratch yourself a couple of times und stretch, und you vas up. I haf to quick lite the fire, und put the kettle on, scrap mit my vife already und maype get some breakfast. You play all tay und haf blenty of fun. I haf to vork all tay and haf blenty of drouble. Ven you die you vos dead; ven I die I haf to go to hell yet."

NOTES AND NEWS

ITINERARY OF THE KODAK EXHIBITION

For the benefit of our readers who desire to attend the Kodak Exhibition mentioned on page 310 of this issue, as well as in the "Notes and News" of our October issue, we publish below the complete itinerary. Full particulars and admission-tickets may be obtained of Kodak agencies in the various cities named, and no photographic worker who aspires to realize the highest possibilities of his camera should fail to view the picture-show and hear the lectures. The itinerary is as follows: Philadelphia, October 29–November 3; New York City, November 5–17; Scranton, November 19–24; Pittsburg, November 26–December 1; Columbus, December 3–8; Indianapolis, December 10–15; St. Louis, December 31–January 12; St. Joseph, January 14–19; Kansas City, January 21–26; Omaha, January 28–February 2; St. Paul, February 4–9; Minneapolis, February 11–16; Milwaukee, February 18–23; Chicago, February 25–28 and March 4–7; Grand Rapids, March 11–16; Toledo, March 19–23; Detroit, March 25–30; Toronto, April 2–6; Montreal, April 8–13; Buffalo, April 16–20.

LIST OF THE SALON HONORS, P. A. OF A. CONVENTION, NIAGARA FALLS

F. R. Barrows, Boston, Mass.; W. N. Brenner, Cincinnati, O.; E. B. Core, New York, N. Y.; Louis Fabyan Bachrach, Worcester, Mass.; J. H. Field, Berlin, Wis.; Elias Goldensky, Philadelphia, Penn.; George G. Halloway, Terre Haute, Ind.; Alfred Holden, Philadelphia, Penn.; F. W. Hornbaker, Scranton, Penn.; Dudley Hoyt, Rochester, N. Y.; Miss Belle Johnson, Monroe City, Mo.; T. Kajiwara, St. Louis, Mo.; John Kennedy, Toronto, Canada; Chas. L. Lewis, Toledo, O.; S. F. Lifshey, Brooklyn, N. Y.; W. S. Lively, McMinnville, Tenn.; J. E. Mock, Rochester, N. Y.; Orr-Kiefer Co., Columbus, O.; Perry & Brecken, Allegheny, Penn.; James W. Porter, Youngstown, O.; George Rogers, Detroit, Mich.; Julius Strauss, St. Louis, Mo.; J. Thibault, Fall River, Mass.; George E. Tingley, Mystic, Conn.; W. K. Van DeGrift, Toledo, O.

EXHIBIT AT THE WORCESTER ART MUSEUM

The Third Annual Exhibition of Photographs at the Worcester Art Museum, Worcester, Mass., opened Friday evening, October 19, with the usual reception, a social function much enjoyed by the many people fortunate enough to be invited. The collection, consisting of 355 prints, was hung in five sections, the work of each contributor being displayed as an individual exhibit. First, there was the work of local men and women; second, the work done by people outside of Worcester, filling the West Gallery. In the East Gallery were the loaned pictures, comprising a group of American musicians by professional workers; ten large prints of North American Indians, by E. S. Curtis of Seattle; and a series of photogravures of Hamburg men and women of the 20th century, by Rudolph Duehrkoop, who was delegated by the German government to make a report on similar work made in the United States.

The jury of admission examined the work submitted with much care and made a most judicious selection, with the result that the present exhibition was a much more important one than any held in previous years, the artistic character of the work, too, being eminently higher. Considering only the work in the East Gallery, which was practically by amateurs, one was impressed by the artistic feeling shown in many of the prints. In seeking to avoid, however, a tendency towards hardness, caused by a sharply-focused and crisply-developed plate, the worker gave free rein to over-exposure and under-development; but, instead of the atmospheric effect hoped for, he obtained only a dim, formless mass, with no illusion of distance. To be successful, a landscape must have atmospheric perspective, an illusion of distance; the foreground, middle distance and extreme background must each be treated differently. There was a great lack of variety in the landscape-studies, whether a path in the woods, a meadow with trees or a brook, still water with reflections, or whatever the *motif*. Many of them seemed very pretty, but few had the quality of excellence in composition or in light and shade, so to leave a lasting impression on the mind. "A Winter Morning," by George Buttler, is a pleasing portrayal of an apple-tree in a snow-field with a reflection on the snow. A ragged, bending pine-tree, overhanging a little stream, by F. H. Pratt, suggested a Japanese print. The best landscape of all in the room was by Lee Russell, "Brook and Mill Pond — Winter." The conception and treatment were broad, the subject interestng and unusual, and well composed. The picture of "Niagara Falls" was necessarily conventional in subject, but George T. Power has made a most successful presentation. The "Winding Brook," by C. F. Clarke, is also a good picture, and one longed for a copy to add to one's art collection. Of the figure-pieces the group by Louise Upton attracted attention because of the delicacy of treatment and the artistic skill displayed in the composition of line, as well as light and shade. J. C. Lyford also had a group of strong work, the subjects not being, however, specially interesting from an impersonal point of view. Jane Dudley had an attractive picture of a child, while F. Holland Day's only contribution, "Mother and Child," was very delicate and soft in tone. There was also a very superior display of flower-studies. Some Iris

blossoms by Dwight A. Davis, and gentian and mountain laurel by E. B. Tucker, were uncommonly successful. William H. Zerbe's landscapes and the genre studies of Louis Fleckenstein charmed by their sterling artistic qualities.

Of the loaned photographs, the portrait of Mrs. H. H. A. Beach, by Charles W. Hearn, combined all the qualities which a good portrait should have. The composition was unusual, the likeness excellent, and there was vivacity and charm in the expression. One admired the picture whether one knew the lady or not, and if one knew her, the picture simply gained in interest. The dignity and strength of the portraits by J. H. Garo were the subject of general comment, the sterling qualities of his work being obviously beyond the skill of the average worker. The same is true, in a great measure, of the other portraits of this collection of American musicians, all of which were reproduced on an imposing scale in the PHOTO-ERA of May, 1905, and attracted universal attention. The ten prints, illustrating the life of the American Indian, by E. S. Curtis, were much admired, this being the first time the people of Worcester had an opportunity to make the acquaintance of this artist's significant work. The portraits by Duehrkoop were very strong and, as a whole, quite beyond criticism, although they clearly impressed one as the work of a regular professional photographer. Let us hope, however, that in time there may be added to such work a touch of art, not yet attained, and which will lift such pictures to a still higher plane.

This extremely interesting exhibition, made possible only through the courtesy and liberality of the Director of the Worcester Art Museum, closes November 18, and will have lasted one month.

THE AMERICAN SHADING-MACHINE

ONE of the most interesting, useful and valuable parts of the equipment of an up-to-date photo-engraving plant is the American Shading-Machine. It is a valuable accessory for designers, publishers and even photographers, since by saving a vast amount of tedious hand labor it brings the artist into closer sympathy with the spirit of his work. It will reproduce in all the photo-processes, and print clear and sharp with or without reduction. It can be used in connection with pen-and-ink sketches, wash-drawings and crayon work, as well as with photographs. The principle involved is a transparent film, flexible, smooth on one side and with engraved lines — stipple, grained or other suitable textures in relief — on the other side, which is the printing-side. The film being transparent, the drawing is constantly in view and the tracing-progress of the artist can be seen through the film. Photo-engravers make their drawings on a perfectly flat and even drawing-board or on card-stock. Artists who desire to use the machine and are not experienced in the use of coated boards can substitute a bristol board or a very smooth drawing-paper. The scratch-board, however, is by far the best, as it has a thick coating which allows repeated erasures when necessary. Though it is several times more expensive, it is the most inexpensive in the end. When making drawings, they should be from one-third to one-half larger than the cut that is to be made. The drawing is made first on ordinary paper, then a careful tracing of it on tracing-paper, which is later transferred to the scratch-board, by placing a blue or black underlay paper between the tracing-paper and the scratch-board. Then take a tracing-point and follow the drawing. When the tracing is completed, make your guide-lines for the lettering and other changes with a hard pencil and your lettering with India ink. When the ink is dry, lay the drawing on the drawing-board of the machine and select your film. When the film is properly adjusted, the process of reproduction begins. When all the shading desired is made, allow the shading to dry. One can stop out the high lights or places, where there is to be no shading, with Chinese white or gum arabic. The machine is used very much by photo-engravers and newspapers to make up their color-blocks, and it relates to photo-engraving and printing-processes of almost every description. Its object is to provide a new and improved half-tone negative, which permits the strengthening of the high-lights to a final point of high quality. In the half-tone negative the same texture pervades all parts, and in order to give different texture to the different parts, to remove the flatness and give life and strength to the finished result, it has heretofore been the practice to engrave by hand or rule by machine, line by line, and dot by dot, into the etched plate. The American Shading-Machine does away with this hand-work, which is slow and expensive. No photo-engraver who is progressive and up-to-date, and who studies economy in the processes of his trade, can afford to be without this valuable machine. The cost is only a trifle, compared with the great saving it effects, and full particulars can be had upon application to The American Shading-Machine Co., 164 Rano St., Buffalo, N. Y.

THE BRITISH JOURNAL ALMANAC

H. GREENWOOD & CO., 24 Wellington St., Strand, London, announces that the "British Journal Almanac" for 1907, edited by George E. Brown, F. I. C., will be ready about December 1. The almanac will be arranged on the lines of the 1906 edition and will contain the latest information on all branches of photography. A special feature of the volume will be an editorial article on "Three-Color Photographic

Bausch & Lomb-Zeiss

Tessar

Used by all Nations

This most perfect of all lenses for hand cameras and general photography is well and favorably known wherever photographs are made for pleasure or for profit. Kodaks, Premos, Centuries, Hawk Eyes, Graflex, all are supplied with Tessar Lenses.

Ask your dealer to furnish you a camera fitted with a Tessar lens that for your own satisfaction you may prove what superior work it will do.

More Bausch & Lomb lenses in actual use than of all other makes combined.

Booklet "Aids to Artistic Aims" free on request.

Bausch & Lomb Optical Co.,

Rochester, N.Y.

NEW YORK BOSTON WASHINGTON CHICAGO SAN FRANCISCO

IN CORRESPONDING WITH ADVERTISERS PLEASE MENTION THE PHOTO-ERA

The Film Pack for Simplicity

If you already have a plate camera, you can use this daylight loading film system as easily as you can use plates. The Premo catalogue and our new book, "The Film Pack for Simplicity," will tell you all about it.

WRITE FOR THEM TO-DAY.

ROCHESTER OPTICAL CO., 66 South St., Rochester, N. Y.

If there is any test in hand camera work to which the Graflex is not equal, there would not be so many Graflexes in use. The Graflex is really the universal hand camera. Is it speed work? Every one knows there's

"Nothing too Quick for a Graflex"

And how can it be done properly without? And for any other kind of photography, just think of having all the advantages of an accurate ground glass focus--the image right right side up at the very instant you make your exposure--without bothering with the focusing cloth, the detaching and attaching of the plate holder, roll holder or film pack adapter as the case may be.

Catalogs at the dealers or

Folmer & Schwing Co.,

Rochester, N. Y.

108

---

20 FLASHES IGNITED FOR 1 CENT

"The Safety"

ELECTRIC PHOTO FLASH-LIGHT

PAT. APPLIED FOR

Operated entirely by electricity. No matches, caps, fuse or lamp. Reliable, safe, simple, easily operated and always ready. When attached to a tripod can be operated six feet or more from the flash. It is 10 inches long and 2½ inches square.

Sent complete EXPRESS PREPAID in the United States upon receipt of

$3.50 P. O. or Express money-order

The Morton Mfg. Co.

40 Dearborn Street

Chicago, Ill.

Dept. E Suite 323

Printing Processes." This article will deal with the various methods of preparing paper prints in natural colors, now so prominently before the photographic public. It comprises instructions on the Pinatype Process, the Sanger-Shepherd Process, the Imbibition Process, the use of the Rotary Carbon Stripping Films, the Double Transfer Process of the Autotype Co., the Gum-Bichromate and Selle Processes and the latest developments of the Bleach-out Direct Process. There will also be many other contributions, by leading English writers.

A SAFE AND EFECTIVE FLASH-LAMP

THE Crown Flash Lamp is a good lamp; in fact, many consider it the best flash-lamp of this size made.

It is arranged so that the magnesium powder is stored in the body of the lamp and blown up through the centre of the flame. The powder is thus thoroughly consumed and a large and powerful light is produced.

In order to fill the magazine with magnesium a removable top is provided. Long or short flashes may be made with it. Only *pure* magnesium may be used.

The Crown is safe, economical and reliable. It is the most powerful lamp of its size on the market. It is well made and finished in polished nickel. The price is only $1.50, and compared with any other similar lamp every one will agree that it is worth more. It is made by the Folmer & Schwing Co., Rochester, N. Y., and sold by almost every dealer.

A SIMPLE AND CONVENIENT THING FOR LANTERN-SLIDE MAKERS

THE fall and winter months are the months when amateurs begin to think about their lantern-slide work. Of all the many arrangements which have ever been offered for making lantern-slides by contact, none of them present the many points of utility and convenience that the F. & S. Lantern Slide Contact Printing Frame does.

It is constructed so that the negative may be shifted to any part of it, brought into contact with the lantern-slide plate, and held securely by the back panel and spring.

The centre frame may be removed and the lantern-slide plate placed in position and secured with centre panel and spring, ready for exposure. These frames are substantially constructed and finished, made of straight-grained cherry with lock-jointed corners, in sizes 4 x 5 and 5 x 7 inches.

The 4 x 5 measures on the outside 8 x 8 inches and is 1⅜ inches deep. The 5 x 7 measures 12 x 12 inches, with a depth of 1½ inches. The price of the 4 x 5 is $3.00 and the 5 x 7 is $4.50.

This frame is made by the Folmer & Schwing Company, Rochester, N. Y., and is undoubtedly on sale with all dealers.

PENNSYLVANIA PHOTOGRAPHIC CONVENTION

THE Executive Board of the Photographers' Association of Pennsylvania met at the Park Hotel, Williamsport, October 2. The members present were, H. H. Detrich, Altoona, president; W. E. Perry, Allegheny, first vice-president; Ralph Bickel, Williamsport, second vice-president; W. I. Goldman, Reading, treasurer, E. E. Seavy, New Castle, secretary. They have secured the hall at the Park Hotel for holding the next convention. The dates selected are April 23, 24 and 25, 1907. The president appointed the following committees: on speakers, Detrich; on collecting pictures, Perry; on floor-space, Bickel; badges and medals, Goldman; catalogue, Seavy. A list of the prizes offered, together with a full statement of the conditions governing entries to the various competitions, may be had upon application to the secretary, E. E. Seavy, New Castle, Penn.

MAJOR MOREHOUSE IN THE INDIAN COUNTRY

WE understand that Major Lee Morehouse, of Lewiston, Idaho, the noted writer of Indian history and photographer, is now in the Nez Percés country in Idaho securing photographs of the Indians during their annual celebration. This means a notable addition to Major Morehouse's already large collection of negatives, numbering, it is said, more than five thousand. Although maintaining his headquarters at Pendleton, Ore., Major Morehouse spends a large portion of his time on the Indian reservation in the Spokane country. His work, both photographic and literary, shows the red man's progress during the last fifty years.

PHOTO-SECESSION EXHIBITION

AN exhibition of photographs by members of the Photo-Secession will be held at the Little Galleries of the Photo-Secession, 291 Fifth Ave., between Thirtieth and Thirty-first Sts., New York, opening on November 10 and closing December 30. The galleries are open from 10 A.M. till 6 P.M. daily, Sundays excepted.

PHOTOGRAPHERS' ASSOCIATION OF WISCONSIN

THE Executive Committee of the Photographers' Association of Wisconsin held its annual meeting at the Republican Hotel, Milwaukee, Wis., Oct. 4, 1906, for the purpose of arranging for the Eleventh Annual Convention, to be held in Milwaukee in 1907.

All of the officers were present, viz.: B. J. Brown, president; W. A. Pryor, first vice-president; W. J. Hillman, second vice-president; A. A. Bish, treasurer; J. M. Bandtel, secretary.

The Republican Hotel was selected as the

official headquarters for the 1907 convention, and the Masonic Temple assembly and banquet halls as the place for meetings and exhibits.

The convention dates were fixed for Apr. 23, 24 and 25, 1907.

Full particulars of the important features may be had of the secretary.

RECOGNITION OF DISEASE-GERMS BY MEANS OF THE PHOTOGRAPHIC PLATE

THE difficulty of distinguishing the bacillus of typhoid fever from a comparatively harmless relative frequently found in the normal human intestine is well known by students of medical science. Dr. Walter T. Stevenson, an eminent English physician, has recently discovered that the difference may be detected by the use of the photographic plate. Dr. Stevenson finds that if these germs are grown in broth for twenty-four hours, and a few drops of the resulting culture, as it is called, are allowed to dry upon the film of a photographic plate, the typhoid bacillus will, upon development of the plate, be seen to have produced scarcely any reduction of the silver, while the bacillus coli-communis will have caused quite a dense deposit. A summary of Dr. Stevenson's observations from *Camera Craft* is as follows:

"(*a*) The discriminative action is the same with some variations in degrees of distinctness, when typhoid and coli cultures of the same age are compared at very different periods after inoculation. Thus cultures of these two organisms in broth compared after four hours' growth and after thirty-three days react as above.

"(*b*) The activity of each increases with time up to a certain age which has not been accurately ascertained. This activity possibly varies with the physical conditions attending culture, but may be taken as increasing from shortly after inoculation to four days of growth.

"(*c*) A coli culture of twenty-four hours' age when compared with a typhoid culture of any age (tested up to thirty-three days) gives the more marked reducing-effect.

"(*d*) After a few hours' growth the broths may be boiled and thus sterilized and the differential effect upon sensitive surface persists.

"(*e*) This discriminative reaction has been obtained with four cultures of coli from different sources and with five typhoid cultures from different sources.

"(*f*) It will be found that if the sensitive plate is wetted with tap-water and also with sterile broth, and simultaneously applications of the cultures are made — four separate areas being thus prepared for comparison — the typhoid and sterile broth do not differ markedly in their actions upon the silver bromide, whereas the effect of the tap-water has been intermediate between that of the coli and the typhoid. It is known that water is to some extent a sensitizer.

"(*g*) The time of exposure of the plate to the application of the cultures has varied between ten and ninety minutes, and the discriminative action of twenty-four hours' cultures found to be best marked with an exposure of forty-five minutes. But from at least ten minutes' exposure upwards the difference is obtained with any broth in which there is a visible growth.

"(*h*) While in some of the earliest of these observations, and before I had gained experience as to the best methods to employ, a few cases occurred in which the distinctive difference was not well marked, in all my recent observations, twenty-four in number, I have unfailingly obtained the differential effect.

"(*i*) Finally, I have observed that if pools of well-grown coli and typhoid broth cultures are poured on a photographic plate and exposed to light, a reduction of silver is seen in a few minutes without development. After about thirty minutes the deposit due to the typhoid broth is distinctly darker than that due to the coli broth. If the pools be now poured off the sensitive plate, the difference reaches its maximum, but as the gelatine dries the distinction is almost lost. Tap-water has no visible effect except the swelling of the wetted gelatine of the plate."

THE HUTCHINSON STUDIO

ON the sixth floor of the Fine Arts Building in Chicago, Mr. Eugene R. Hutchinson has a studio where he makes photographic portraits. Not that his "home portraiture" has been given up, but for the convenience of those wishing sittings elsewhere this studio has been opened.

THE TESSAR LENS FOR 3A KODAKS

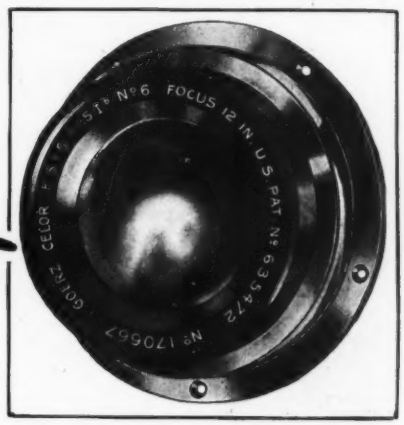
THE Tessar lens made by Carl Zeiss at Jena, having been very popular with Kodak users, is now offered in a new tube mount from which the cells can be readily removed and screwed into any 4 x 5 shutter. The Tessar is particularly suitable for the 3A F. P. K., and with the compound shutter, the speed of which varies from 1 to $\frac{1}{200}$ of a second, makes an excellent outfit. This lens has a speed of F. 6.3, and a unique feature is the polished black finish of the mount.

On application to E. B. Meyrowitz, 104 East 23d St., New York City, a most interesting catalogue of Carl Zeiss lenses will be sent.

THE ELMENDORF TRAVEL TALKS

DWIGHT ELMENDORF, who has during the last eight years made himself exceedingly popular in his travel talks in New York, Philadelphia, Washington and the Western cities, is to enter the Boston lecture-field at Tremont Temple on five successive Saturday afternoons, be-

GOERZ TALK



Number
SEVEN

The Lens as a Money Maker

Have you ever thought of the Lens as a money-earning power?

Have you ever considered that superior work cannot be done with an indifferent lens, and that a first-class instrument will repay for its cost many a hundred times?

HIGH PRICES and BIG MONEY are only at the command of the SUCCESSFUL MAN. The man WHOSE REPUTATION HAS BEEN ESTABLISHED BY THE SUPERIOR QUALITY OF HIS WORK.

Any device, therefore, that may help him to improve this work becomes to him an absolute necessity, an invaluable asset, a source of further income and increased wealth.

IN OTHER WORDS IT PUTS AT HIS DISPOSAL ADDED MONEY-EARNING POWER.

The Goerz Double Anastigmat Lenses will precisely do this by all photographers whether professionals or amateurs who wish to improve the quality of their work, to better their position, to command more money.

The Goerz Lenses are the most perfect instuments of their kind on the market, and the very best workers use them.

There are many "reasons Why" that will account for that fact. Our lens catalogue tells all about them and gives full particulars about our double anastigmats "Celor" and "Dagor" of world-wide reputation, our Goerz Anschutz Cameras, our new Sector Shutter and our other lenses and apparatus.

We court inspection.

We want you to realize what these lenses actually are, to investigate and ascertain their numerous advantages. We give you a ten days' trial free of charge. Don't be bashful about it. Just send us the name and address of your dealer or write for our Lens catalogue.

C. P. GOERZ AMERICAN OPTICAL CO.

Union Square, NEW YORK, and Heyworth Building, CHICAGO.
Pacific Coast Agents, Messrs. Tellgmann & Torka, San Francisco, Cal.

BERLIN PARIS LONDON ST. PETERSBURG VIENNA

LEPAGE'S GLUES & PASTE

FOR PHOTOGRAPHERS

Put up in jars and in tubes —Dries very quickly— Never discolors the print— Corners will not curl — Put up in bulk for large users.

IF YOUR STOCK HOUSE DOES NOT CARRY LEPAGE'S, WRITE US AND WE WILL SEE THAT YOU ARE SUPPLIED
ACCEPT NO SUBSTITUTE

For Photo-Engravers

LePage's is recognized everywhere as the only glue to be used in Process-Work.
Sample of Photo-Paste mailed for 10 cents.

RUSSIA CEMENT CO.
201 Essex Ave., Gloucester, Mass.

THE LARGEST CONSUMERS

AND LEADING DEALERS BUY

AGFA

PRODUCTS, AND "THERE MUST BE A *REASON*"
CONVINCE YOURSELF

TRY

Agfa Metol	Agfa Amidol	Agfa Rodinal
Agfa Ortol	Agfa Eikonogen	Agfa Intensifier
Agfa Glycin	Agfa Reducer	Agfa Pyro

AGFA BLITZLICHT
(The Best and Safest Flash-Powder Known)

BERLIN ANILINE WORKS, 213-215 Water St., New York

ginning November 17. It is said that the peculiar charm of Mr. Elmendorf's lectures is the simplicity and directness which characterize them. His pictures are unique, as they are taken, colored and prepared solely by the lecturer, so that they are the product of a single mind, a single purpose, and their effect is correspondingly intensified.

MEETING OF THE PROFESSIONAL PHOTOGRAPHERS' SOCIETY OF NEW YORK

THE Metropolitan Section of the Professional Photographers' Society of New York, Mr. E. B. Core, president, held its first meeting since summer in the parlors of the Milton Waide Metropolitan School of Photography, Inc., 32 Union Sq., New York City, Tuesday evening, October 9. As is customary, the meeting was made up of business discussions interspersed with social "get togetherism." The experiences of Messrs. McDonald, Bryon and Falk during their summer vacations in Europe furnished agreeable diversion, and all together the meeting was one of the Section's best.

THE WORK OF MRS. CALEB KEENE

THE ways in which the advantages of photography are being utilized seem to be without limit. In the realm of education photography is an important factor, but here its value has only begun to be appreciated, and it will not be long ere this most wonderful of all sciences will take an honored place in the daily curriculum of the public schools. Among numerous applications of photography to educational work is the introduction into public schools of photographic nature studies. Here the accurate, faithful products of the camera are gradually displacing the time-honored lithograph, which, though generally artistic in design, is not always a correct facsimile of the original, a defect easily remedied by photography. If, in addition to this important quality, the photograph be strikingly artistic and also possesses the element of cheapness of production, its preference to the lithograph will be easily understood. A worker who has gained renown in this valuable branch of photography is Mrs. Caleb Keene, of Cape Town, South Africa. Her standing as a pictorialist of first rank was won by a series of brilliant successes, one of which, greatly applauded in England, is reproduced in these pages. This characteristic group, entitled "Cape Malay Laundry," was to have embellished our "Women's Number," but unfortunately it arrived too late.

We have before us a varied assortment of Mrs. Keene's Nature Studies, in the form of finely-executed half-tone impressions, measuring eight by ten inches, intended for use in schools and to materially enhance the study of natural history. The botanical and zoölogical subjects selected by Mrs. Keene for photographic illustration fully demonstrate her rare powers of discrimination, her strong artistic perception and technical ability, as well as her command over the resources of her art. It is quite obvious, too, that she performs her task *con amore*, and the extraordinary success marking her efforts in this important domain of science is proof of our contention that certain phases of photography belong emphatically to woman's sphere.

Though living in a community remote from centres of civilization, distant from sources of sympathetic encouragement and helpfulness, and laboring under difficulties not easily appreciated by workers in the United States, Mrs. Keene pursues her work with unflagging devotion and industry. She is publishing in England a serial work in folio form size, entitled "Keene's Nature Studies," which is devoted chiefly to flowers, fruits and seeds. The publication is artistic and attractive in design, while its numerous half-tone illustrations are remarkable for their high artistic and technical excellence. The lady is publishing a similar work pertaining to the flora and birds of Africa, as well as to types of people. That enterprises such as these possess great scientific and educational value is self-evident, and we are sure that our readers, one and all, will wish that so devoted and capable a worker as Mrs. Caleb Keene will, besides a moral satisfaction already hers, reap suitable financial reward for her patient and intelligent labors.

PHOTOGRAPHIC PROBLEMS
WITH SOLUTIONS BY PRACTICAL MEN

UNDER this heading we insert questions of a practical character relating to photography, preferably the technical side. For each suitable question which we publish, we offer twenty-five cents. We also give two dollars for every answer we print, our selection to be absolutely free of any prejudice. The answers to any problem should be in our hands within ten days after the same shall have appeared. The replies should deal concisely with the points at issue and not exceed three hundred words in length. In this connection we shall use only the initials of correspondents, whose identity will, on no account, be disclosed. Irrelevant or discursive answers will not be considered. (OVER)

NOTES AND NEWS

QUESTIONS.

What is the best studio light, and why? — C. E. A.

How should a portrait-negative be retouched to preserve the likeness and character of the sitter?

AN ANSWER TO THE QUESTION ON WORKING ARISTO PAPER

The question of W. F. N. might just as well be: "*Can* the amateur photographer, etc.?" To this query my answer would be: "As a general thing, No!" The reason is not far to seek. The professional does everything on a larger scale than the amateur, and more is the pity. In portraiture alone the professional has a vast advantage over the amateur, for he employs the ideal portrait-lens, which, on account of its bulk and weight, cannot well be fitted to the amateur's folding camera.

But I am wandering from my subject. The professional with his numerous daily sittings is obliged to develop a large number of plates, and, to save time, handles as many as six 5 x 7 plates at a time, often more than this number, all in one large tray. This requires a large volume of developer, which maintains a uniform action much more easily than does a smaller quantity, say, three ounces of solution in a 5 x 7 tray doing duty for one plate of that size. If a sediment forms in the diminutive tray, or if by accident one drop of hypo. falls in, it vitiates the developer almost immediately, and the trouble begins. In the case of the professional's tray, usually one of generous dimensions, a chemical change in the developer from the above-named causes does not occur. The reason for this is obvious.

Now this is true also in the handling of gelatine prints, for example, and, more especially, of aristo-prints, with their delicate collodion surface. In every stage of the manipulation the professional — in this case the printer usually has charge of this department — operates with large, wooden, asphalt-coated trays, often forty inches long and wide in proportion. This enables him to handle a large batch of prints in one single operation with astonishing ease, permitting them to float about free from the bottom of the tray and free from each other, without interference likely to damage their delicate surface.

Even the preliminary rinsing is deemed important; but the toning-process, which follows, requires more care. If during this operation it is found necessary to strengthen the bath by the addition of gold-solution, the matter is simple enough, for by several swashes of the hand the professional quickly effects a thorough mixing. When chloro-platinite of potassium is the dominant factor, still more experience is required, and additions of this ingredient to the toning-solution, when deemed necessary, are made with ease by the experienced hand. If the professional is desirous of producing an aristo-print of superior quality, he realizes that the utmost care must be exercised in every stage of its production until it is safely affixed to the mount. He will, therefore, be careful not to remove the print prematurely from the toning-bath, for otherwise the necessary amount of gold will not be deposited and the fixing-bath will not be able to impart sufficient "body" to the picture. If, on the other hand, the prints are over-toned, they will have a feeble and washed-out appearance when taken from the fixing-solution.

When it comes to the fixing of the prints, experience alone can dictate the length of time here required. The professional printer is careful to make sufficient allowance in the printing of the impressions for loss of strength and color in the fixing-bath. Of course it is easier to obtain the requisite depth of the print when several dozen are pulled off from one single negative. To allow for the possible loss of one print or two, the professional sometimes prints a few extra ones. Another item of importance, which the professional takes care to note, is the temperature of the bath. This should be kept as near 70° as possible, both in winter and summer.

The professional, like the amateur, has his troubles. In the case of aristo-prints he often has to contend with blisters or bubbles, fastidiously referred to as "air-bells." When once the cause of this difficulty becomes known, the professional succeeds in removing it. Certain reddish marks on the pictures, the knowing printer correctly attributes to touching the surface of the prints with perspiring fingers, before toning, and is more careful the next time.

I find myself giving a series of "don'ts," which, while helpful to the amateur, will unduly prolong this communication. I will close by saying that, if the amateur will provide himself with, say, four good-sized trays, taking care to use each for a specific purpose and never mistake the toning for the fixing tray, he will have made a good start. If he have ordinary intelligence and knows the value of cleanliness in photographic manipulations, the amateur should find no difficulty in following the printed directions which accompany each package of aristo-platino paper. The manufacturers maintain in each large city of the United States, and also in Canada and New Mexico, at least one expert demonstrator, who will be glad to meet the amateur, as he does the professional, when the latter has struck a snag; and the good-natured agent does not rest till the technical difficulty has been located and eliminated.

Thus I do not hesitate to say that it is possible for the amateur to produce as excellent aristo-prints as does the first-class professional photographer. F. E. F.

The Carl Zeiss "Tessar" F: 6.3

A LENS of those remarkable qualities which make it ideal for the all-round work of advanced amateurs. Can be readily fitted with standard shutter to any make of hand camera. Its reasonable price brings it within the reach of all who appreciate the possession of a perfect working outfit. Gives wonderful results at the highest speed.

Write at once for complete illustrated catalogue of Zeiss Lenses.

E. B. Meyrowitz

Sole Agent for the United States

104 East 23d Street, New York City, U. S. A.

ATTEND THE

Illinois College of Photography

A well-paying and delightful profession easily learned. Terms easy and living inexpensive. Our students win convention prizes. Good positions secured for graduates. Endorsed by the Photographers' Association of Illinois, and the International Association of Photo-Engravers. Write for our illustrated Catalogue. Address

ILLINOIS COLLEGE OF PHOTOGRAPHY, 910 Wabash Ave.

L. H. BISSELL, Pres. **Effingham, Ill.**

Conducted in Connection with the Bissell College of Photo-Engraving.

RALPH J. GOLSEN

"THE LENS MAN" "THE OUTFIT HOUSE"

SUPPLIES OF ALL KINDS

EMBODIED IN OUR

NEW BARGAIN LIST

(Sent on receipt of postal request.)

You will find *new features that will interest you*, and all of them *money savers*. All orders for *supplies* and *apparatus shipped promptly*

72-74 WABASH AVE.

CHICAGO

LONG DISTANCE PHONE CENTRAL-1196

FOR RETOUCHING *BUY*

DIXON'S AMERICAN GRAPHITE **PENCILS**

Mention this Paper and Send 16c., Stamps, for Samples

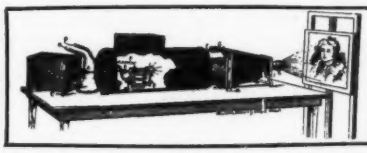
JOSEPH DIXON CRUCIBLE CO., Jersey City, N. J.

FOR SALE—PHOTO BUSINESS in the wide-awake town of Whitman. Population 7,000. A fine opening for some one. Fitted up for work up to 11x14. Also an ARISTO LAMP for evening work.

Doing a good business and best time of year to buy.

Health demands quick sale.

A. A. HASKELL, Whitman, Mass.



THE FRANKLIN ENLARGING OUTFITS

Are especially designed for rapid and convenient work. They are made for 4 x 5, 5 x 7, 6 1-2 x 8 1-2 and 8 x 10 negatives and sell from $24.00 upwards. They are arranged to use Electric, Acetylene, Welsbach and the Bright White Light and are in use by the United States Government, leading Colleges and the largest Newspaper plants in the country. Send for list, also circulars of Photoscript for titling negatives and our Great Bargain List.

WILLIAMS, BROWN & EARLE, Dept. K, 918 Chestnut St., Philadelphia

THE PLATINOTYPE

"Dear Sirs: Your new Japine Sepia Papers are great, never used anything better. Yours truly, J. ZWEIFEL." (Dayton, Ohio.)

NOTE. Professional Printers are given free instructions in printing Platinotype papers, including JAPINE. A few days or a week spent with us will be very beneficial to every printer who can come.

WILLIS & CLEMENTS **Philadelphia, Pa.**

Polygraphisches Institut A. — G.
ZÜRICH, SWITZERLAND

Prepares artistic printed matter by all photo-mechanical processes, half-tone, three-color process, zinc etching, lithography, typography, etc. Business cards, prospectuses, catalogues, booklets, advertisements, post-cards, posters, etc. ESTIMATES OF COST CHEERFULLY AND FREE.

Bulletin Photoglob

A richly illustrated German monthly magazine for amateurs. Size 9 1-2 x 12 1-2 inches, superb execution Subscription price to foreign countries, including postage, Mk. 6.50, or $1.50. Sample copy free on request Subscriptions may be sent to PHOTO-ERA or direct to the publishers.

POLYGRAPHISCHES INSTITUT
A.-G., Zürich, Switzerland

I CAN SELL
Your Real Estate or Business
NO MATTER WHERE LOCATED

Properties and Business of all kinds sold quickly for cash in all parts of the United States. Don't wait. Write to-day, describing what you have to sell and give cash price on same.

If You Want to Buy

any kind of Business or Real Estate anywhere, at any price, write me your requirements. I can save you time and money.

DAVID P. TAFF, *The Land Man*
415 Kansas Avenue Topeka, Kans.

HIGGINS'

- Photo-Mounter Paste
- Drawing-Inks, Blacks and Colors
- Eternal Writing-Ink
- Engrossing-Ink
- Taurine Mucilage
- Drawing-Board and Library Mucilage
- Office Paste
- Liquid Paste
- Vegetable Glue, Etc., Etc.

ARE THE FINEST AND BEST GOODS OF THEIR KIND

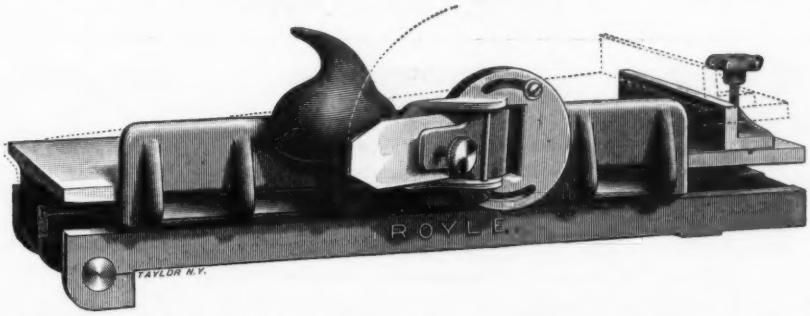
Emancipate yourself from the use of corrosive and ill-smelling inks and adhesives and adopt the

HIGGINS' INKS AND ADHESIVES

for home, office, studio and class work. They will be a revelation to you. At dealers generally.

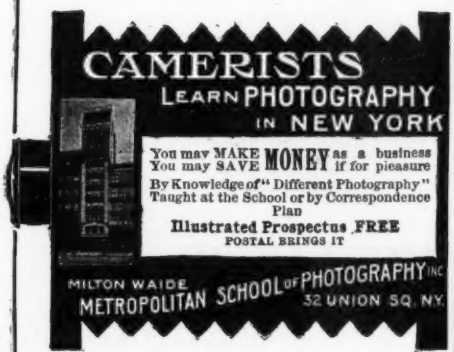
CHAS. M. HIGGINS & CO., Originators and Manufacturers Refined Inks and Adhesives
Main Office and Factory, Brooklyn, N. Y., U. S. A.
New York Chicago London

AN INEXPENSIVE TOOL



The Royle Shoot-Board is of inestimable worth to small establishments for squaring up and beveling half-tone plates. It does such work quickly and accurately. All the parts have been designed for ease in handling and rapidity in operation. It is one of those small tools always in demand in plants of limited output. Circular will be furnished on application.

JOHN ROYLE & SONS **Paterson, N. J., U. S. A.**


CAMERISTS
LEARN PHOTOGRAPHY
IN NEW YORK
You may MAKE MONEY as a business
You may SAVE if for pleasure
By Knowledge of "Different Photography"
Taught at the School or by Correspondence Plan
Illustrated Prospectus FREE
POSTAL BRINGS IT
MILTON WAIDE
METROPOLITAN SCHOOL OF PHOTOGRAPHY INC
32 UNION SQ. N.Y.

LEXINGTON HOTEL

Just off Broadway on 47th Street, West and Long Acre Square NEW YORK

OPENED JAN. 1906

Absolutely Fireproof

Unsurpassed Apartments

324 Rooms with Private Baths

HIGH-CLASS, UP-TO-DATE HOTEL

$1.50 PER DAY, AND UP

European Plan

Within Five Minutes' Walk of EIGHT THEATRES

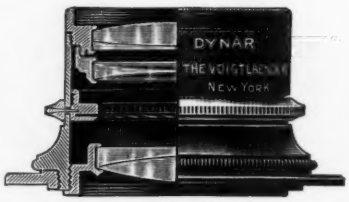
Send for Souvenir Postal Cards

GEO. R. JONES & SONS

VOIGTLAENDER SPECIAL LENSES

FOR KODAKS

DYNAR
No. 3 SPECIAL
6½ in. Focus, f. 6
For 3a. F. P. K.
$25.00



COLLINEAR
(III)
No. 3 SPECIAL
6½ in. Focus, f. 6.8
FOR 3a. F. P. K.
$30.00

No new shutter required — Lenses fit the 3a Kodak Shutter

DOUBLE SPEED — *FINER DEFINITION*

WRITE TO

The Voigtlaender & Son Optical Co.

129 WEST 23d STREET, NEW YORK

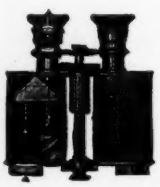
Korona Cameras

Famous for their Lens equipments and sound principles of construction.

KORONAS have many advantages entirely their own, and they are made to suit every requirement of photographic work.

Sold by Anti-Trust dealers only and direct from the factory

IT'S ALL IN THE LENS



ONE LOOK THROUGH A TURNER-REICH PRISMATIC BINOCULAR brings conviction that an ordinary field-glass is a waste of money at any price.

Gundlach-Manhattan Optical Co.

765 Clinton Ave., So. — Rochester, N. Y.

COOKE LENSES

GET A COOKE ANASTIGMAT and you'll get perfect negatives if you handle the lens aright.

You'll secure exquisite definition with the diaphragm wide open, and your pictures will have that brilliance which makes your friends ask, "WHAT LENS?"

Buy COOKE LENSES of

THE STUDIO CAMERA EXCHANGE

As we are constantly receiving second-hand cameras and lenses in exchange for other goods, you would do well to write us **We Buy, Sell and Exchange** your wants in that line, as we probably can supply them, and you will save money. Money back if desired.

Send for Bargain List of Lenses

C. W. SHEPARD, Studio Bldg., 110 Tremont St., **Boston**

Eastman Kodak Company
ROCHESTER, N. Y., *The Kodak City.*

SPECIAL MOUNTING.

The progressive amateur always desires to get away from the stereotyped way of doing things and to impress his individuality on everything he does. There is no greater field for the exercise of the artistic sense and ingenuity that in the compilation of an album of views, portraits, or a souvenir of some special occasion. More often than not the actual picture is contained in but a portion of the full original print and sometimes to properly balance a page requires a long narrow print or one round or oval in shape.

When mounting with paste the full sized print may be mounted on the usual thin album leaf by tipping the edges, but with the smaller prints trouble at once begins as none of the prints can be mounted in full contact without the leaf cockling, and tipping the edge of the small print usually means its coming off on the slightest provocation.

The remedy for this or any other mounting problem is Kodak Dry Mounting Tissue—any print of any shape or size may be mounted in full contact even on thin paper and will be absolutely flat—and, an important point, no souvenir hunting friend will be able to remove them from the album, as a print mounted with Kodak Dry Mounting Tissue stays mounted.

Much work to mount with Kodak Dry Mounting Tissue? Just press with a hot iron—that's all. Ask your dealer.

FLASH FUN.

Flashlight photography embraces a much larger field than placing a number of persons in a group—Hold Still—Touch off the flash powder—Woof ! ! !

As Eastman Flash Sheets burn considerably slower than flash light powders a softer, evener illumination is assured, avoiding the startled expression so often in evidence.

By making use of one or more flash sheets behind a screen of cheese cloth which may be held in any desired position, and the proper use of a simple white reflector, (a towel pinned to a lath will answer) any lighting may be easily made.

The Flash Sheets have this advantage over daylight, in that the volume and direction of the light may be absolutely controlled.

Many novel effects may be secured, such as fire place pictures by placing a flash sheet in the fire place, screening the flash so it will not reflect directly into the lens.

On camping trips, an excellent picture of the campers around the evening fire may be made by placing a couple of flash sheets just in front of the fire. Seat one of the group between the fire and the camera to screen the lens from the flash, this member of the group to ignite the flash—he will be rendered in outline only which will serve to heighten the night effect.

Striking window effects may be produced by placing the flash outside the window, just out of line with the lens, having the subject just inside the room looking out.

These are only a few suggestions for flash sheet work as the possibilities are unlimited and entail no apparatus beyond the flash sheets and a sheet of cardboard or tin to fasten them to.

Ask your dealer.

DOCTOR KODAK.

A recent number of a well-known publication contained an amusing article entitled "My Holiday with a Camera." This article brings home to the "run-down" man without a hobby the advantages and delights of the Kodak as an out-door companion.

IN CORRESPONDING WITH ADVERTISERS PLEASE MENTION THE PHOTO-ERA

Eastman Kodak Company
ROCHESTER, N. Y., *The Kodak City.*

"Get out of doors and take a Camera with you," was the doctor's instructions. When the patient returned from his vacation perfectly recovered, he summed up his experience thus :—

" I will say this for that first camera experience of mine: it kept me walking about; it interested me and amused me; it kept my mind from work, and worry, and ennui, and built me up a new man."

The Kodak means more than recreation, there are other amusements that would keep one walking about and interested but there is no other form of recreation so universal in application.

Any where, any time, by night or day the Kodak furnishes an inexhaustable field of both recreation and instruction with the added advantage that the pictures made with the Kodak enable its possessor not only to live over many pleasant hours but to share them with others.

PERSONAL FINGERS.

The development of an exposed plate or film is for the sole purpose of transforming the latent image into a visible one in order that a print may be made from it. The quality of the visible image or negative will depend almost wholly upon the exposure to actinic light the plate has received.

When the amount of exposure is *known*, if it be either above or below normal, certain modifications of the developer may be made to secure proper contrasts, or certain restrainers or accelerators may be locally applied to the sensitive surface during development but *all such manipulation must be performed practically in the dark by the feeble glow of the dark-room lamp.*

Modifications of density may be made after development and fixation have been completed and with much greater certainty as *the operation is performed in full day light*, and after you have been able to determine by making a proof, the exact amount of modification necessary.

When the time of exposure is unknown, the developer cannot be prepared with certainty as to its suitability, and once the image has appeared no accelerator or restrainer added to the developer can alter the contrast. The logical method for the development of either over, under or normal exposures is time or tank development, this is made patent by the following extract from an article on "Developing Unknown Exposures" by F. J. Mortimer, the editor of *Photographic News* (London) in a recent number of that publication:

"The occasion sometimes arises for the production of negatives from plates that have been exposed, but a record of the exposures lost. The methodical amateur, unfortunately, is not in the majority among his class, and more often than not makes many exposures during his photographic outings that are not immediately entered in the 'exposure notebook' carried so religiously by both beginner and advanced worker.

Frequently, therefore, although the plates are known to have had a fleeting visit from actinic light, it happens that a remembrance of the subject is the only clue that is followed in the dark-room.

Many other occasions may also arise when the photographer is called upon to develop plates the exposures of which he is unacquainted with.

A universal panacea for the treatment of difficulties of this description has been suggested in the employment of time development. The many advantages of this method cannot be denied, but although there are a great number of photographers who like to turn out their negatives with the

assistance of as many time, labor, and thought-saving devices as possible, there are as many more who delight in and prefer to have a personal finger in the pie, and use their own judgment—*good* or *bad*—when dealing with unknown exposures.

With unknown exposures, however, the personal element counts for little unless some definite plan is adopted for their treatment.

This treatment so far as the preliminary stages of development are concerned, can be summed up in the advice:—'dilute the developer.'

Every exposed plate must be either under-exposed, normally-exposed, or over-exposed. If it has been under-exposed a dilute developer will do no harm, although a considerable time will probably elapse before the first appearance of the image ; if normally-exposed a similar developer will give as good a negative as a strong solution, while if the plate has been over-exposed, the dilute developer becomes a necessity if the negative is to be saved.

For certainty of results and convenience, the only points to be considered, tank development is *the* method and the Kodak Tank Developer must produce the highest possible percentage of good results *independent of the skill or ability* of the person making use of same."

HIS ONLY ARGUMENT.

Anybody can purchase a few pounds of chemicals, copy a few formulæ from a photographic journal and set up in business as a manufacturer of photographic preparations.

He may or may not be a chemist, but in either event his knowledge is limited to the preparations he is putting up and he neither knows nor cares about the composition of the film, plates or paper with which his preparations are to be used.

Certain chemicals used in photography look alike whether pure or impure, and up to a certain point *act* alike and it takes more than a prescription clerk to determine their fitness for photographic use.

Immerse an exposed plate in Blank's Universal Developer and you can, without doubt, obtain a negative; but will that developer afford you all the brilliance and gradation the plate is capable of yielding?

Not possessing exact knowledge of the composition of the plate emulsion it is not possible for any outside manufacturer to prepare a developer exactly suited to such plate, and this holds good with all other preparations.

You may purchase Blanks Universal for less money than you can the developer put up by the plate or paper manufacturer as this is and can be his *only* selling argument. The preparations put up by the plate or paper manufacturer must be exactly adapted to his product and for his own salvation *must* be sold at the lowest possible price consistent with quality.

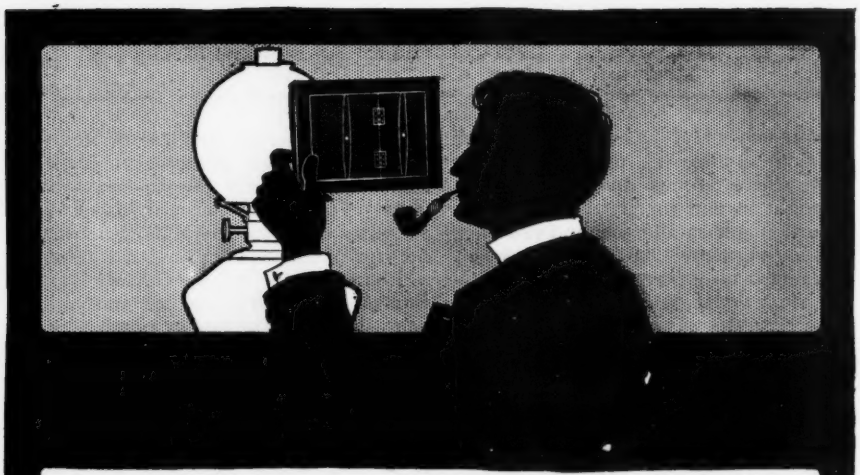
It is not economy to save five cents on a bottle of developer that will produce a dozen second-grade negatives.

The No. 4A FOLDING KODAK

For Pictures 4¼ x 6½.

A 40 H. P. Touring Car for the man who has outgrown his F. P. K. runabout.

All Dealers.



OTHER PAPERS
ARE TRIED

VELOX

is Used

A Grade for Every Use
and
A Use for Every Grade

Nepera Division,
EASTMAN KODAK CO.
ROCHESTER, N. Y.

All Dealers.